

To: Hupp, Sydney[hupp.sydney@epa.gov]
Cc: Bolen, Brittany[bolen.brittany@epa.gov]; Dickerson, Aaron[dickerson.aaron@epa.gov]; Chmielewski, Kevin[chmielewski.kevin@epa.gov]
From: Dravis, Samantha
Sent: Mon 5/29/2017 1:04:12 PM
Subject: Re: Invitation to Advocacy's Regulatory Reform Roundtables in Louisiana

I did yes.. I didn't realize the invitation was for SP, though. Let me follow back up.

Sent from my iPad

On May 28, 2017, at 11:22 PM, Hupp, Sydney <hupp.sydney@epa.gov> wrote:

Did you let them know we would be gone?

Sydney Hupp

Executive Scheduler

Office of the Administrator

202.816.1659 (c)

From: Dravis, Samantha
Sent: Friday, May 26, 2017 12:04 PM
To: Hope, Brian <Hope.Brian@epa.gov>
Cc: Bolen, Brittany <bolen.brittany@epa.gov>; Dickerson, Aaron <dickerson.aaron@epa.gov>; Hupp, Sydney <hupp.sydney@epa.gov>; Chmielewski, Kevin <chmielewski.kevin@epa.gov>
Subject: Re: Invitation to Advocacy's Regulatory Reform Roundtables in Louisiana

I have been in touch with them.

Sent from my iPad

On May 26, 2017, at 11:38 AM, Hope, Brian <Hope.Brian@epa.gov> wrote:

Sent from my iPhone

Begin forwarded message:

From: "Williams, Emily M." <emily.williams@sba.gov>
Date: May 26, 2017 at 10:35:23 AM EDT
To: "Williams, Emily M." <emily.williams@sba.gov>
Subject: **Invitation to Advocacy's Regulatory Reform Roundtables in Louisiana**

Please see attached invitation from Acting Chief Counsel Major L. Clark, III to send your RRO or a designee familiar with regulatory reform from your headquarters or a local office. The first two roundtables are scheduled for June 7 in Baton Rouge and June 8 in New Orleans.

Please let me know if you have any questions about the events.

Thanks,

Emily

Emily Mantz Williams

Outreach and Events Specialist // Acting Congressional Affairs and Public Relations Manager

SBA // Office of Advocacy

409 3rd St. SW, Washington, D.C. 20416

<image001.png>

emily.williams@sba.gov

<image002.png>

202.205.6949

<image003.png>

<image004.png>

<image005.png>

<image006.png>

<image007.png>

<image008.png>

<image009.png>

<image010.png>

<Invitation for Reg Roundtables - LA.pdf>

To: Debell, Kevin[debell.kevin@epa.gov]
From: Dravis, Samantha
Sent: Tue 5/16/2017 5:21:30 PM
Subject: RE: EPA Comments on Draft Report

Could you bring a copy of this and your one pager at 1:30?

From: Debell, Kevin
Sent: Tuesday, May 16, 2017 12:53 PM
To: Dravis, Samantha <dravis.samantha@epa.gov>; Bolen, Brittany <bolen.brittany@epa.gov>
Subject: EPA Comments on Draft Report

Hi Samantha and Brittany:

I hope everything is going well today. Attached please find a table containing EPA comments on the Department of Commerce's draft report on streamlining permitting and regulatory reform.

While the table includes a relatively large set of comments, most simply provide additional information for the sake of clarity and accuracy. The comments that suggest substantive changes to DOC's recommendations can be found in lines 24, 31, 34 through 38, and 47. In working with the programs, we have made clear that we may not wish to recommend deletion of recommended tasks and may remove those comments. You'll see several instances in which the programs provided alternate language for items they might prefer to be removed from the report.

Of course, the DOC request today may change or make moot some of the comments in this table. We will provide a draft transmittal message for the table to you later today. Please let me know if you have any questions.

Best,

Kevin

Kevin M. DeBell, Ph.D., Acting Director

U.S. Environmental Protection Agency

Office of the Administrator / Office of Policy / Office of Strategic Environmental Management

1200 Pennsylvania Avenue NW (1807T)

William Jefferson Clinton Building West, Room 4104P

Washington, DC 20460

o 202 566 1931

c 202 641 0711

debell.kevin@epa.gov

I'm always open to feedback on my performance and service. Please provide your comments here: <https://www.surveymonkey.com/r/debellfeedback>. Your comments will be provided to me anonymously.

To: Rob Underwood[runderwood@pmaa.org]
Cc: Mark Morgan[markmorgan@verizon.net]
From: Dravis, Samantha
Sent: Tue 7/18/2017 6:32:41 PM
Subject: Re: Meeting Request

Please get in touch with my assistant Robin Kime, she handles scheduling.

Sent from my iPhone

On Jul 18, 2017, at 11:01 AM, Rob Underwood <runderwood@pmaa.org> wrote:

Hi Samantha,

I'm going to give it one more try.

Would you be available to meet regarding the 2015 Underground Storage Tank final rule next week with myself and PMAA Regulatory Counsel Mark Morgan?

We are free next Tuesday, Wednesday afternoon, Thursday and Friday.

Thanks and hope all is well!

Rob Underwood

President

Petroleum Marketers Association of America (PMAA)

1901 North Fort Myer Drive, Suite 500

Arlington, VA 22209

Email: runderwood@pmaa.org

Work: 703.351.8000

Cell: 703.470.4566

From: Rob Underwood
Sent: Tuesday, June 20, 2017 11:55 AM
To: Dravis.samantha@Epa.gov
Subject: Re: Evaluation of Existing Regulations

Hi Samantha,

Would you be available to meet regarding the 2015 Underground Storage Tank final rule on Thursday, July 6th anytime after 11am with myself and PMAA Regulatory Counsel Mark Morgan?

Thanks and hope all is well!

Rob Underwood

PMAA President

On Jun 2, 2017, at 5:58 AM, Rob Underwood <runderwood@pmaa.org> wrote:

Samantha,

On behalf of the Petroleum Marketers Association of America (PMAA), I am pleased to submit the following comments to the EPA's Regulatory Reform Task Force regarding the EPA's Office of Underground Storage Tanks (OUST) published regulatory amendments to the federal UST regulations on July 15, 2015 (Revising

Underground Storage Tank Regulations, 80 Fed. Reg. 41566 (July 15, 2015)).

PMAA continues to work with OUST to reduce the final rule's regulatory burden on petroleum marketers. OUST has taken many of PMAA's concerns into account, however, we continue to believe that the best path forward is to grant a compliance extension to give small business petroleum marketers needed time to comply with the July 2015 final rule.

Feel free to call or email me if you have any questions. We would appreciate a meeting with you sometime later this month at your convenience.

Best Regards,

Rob Underwood

President

Petroleum Marketers Association of America (PMAA)

1901 North Fort Myer Drive, Suite 500

Arlington, VA 22209

runderwood@pmaa.org

703.351.8000 (Office)

703.470.4566 (Cell)

<PMAA COMMENTS UST - Regulatory Relief.pdf>

To: Gunasekara, Mandy[Gunasekara.Mandy@epa.gov]; Brown, Byron[brown.byron@epa.gov]; Greenwalt, Sarah[greenwalt.sarah@epa.gov]; Bennett, Tate[Bennett.Tate@epa.gov]; Lyons, Troy[lyons.troy@epa.gov]; Wagner, Kenneth[wagner.kenneth@epa.gov]; Beck, NancyB[beck.nancyb@epa.gov]; Bolen, Brittany[bolen.brittany@epa.gov]
Cc: Jackson, Ryan[jackson.ryan@epa.gov]
From: Dravis, Samantha
Sent: Wed 5/3/2017 3:31:02 PM
Subject: Updates to Issues Tracker
[OP Issues Tracker \(003\).docx](#)

Hi everyone,

I am working to update the list of policy and other major items that each member of our political team is working on so that our list is up to date and accurate. Attached is the template I have been working from. It would be great if everyone here could respond to me via email on all of the issues, regs, or major cases you're working on and the status of them so that I can update the tracker with the latest info.

These are informative for the 8am meetings and just so we are all on the same page generally. Don't worry about making updates in the document yourself, just send an email in whatever format is best for you and I will update it and then re-distribute to the group.

Thank you!

Samantha

To: Lovell, William[lovell.william@epa.gov]
Cc: Lopez, George[lopez.george@epa.gov]; Daisy Letendre[daisycletendre@gmail.com]
From: Dravis, Samantha
Sent: Wed 6/28/2017 7:42:43 PM
Subject: RE: Gentle reminder on the article of EPA priorities in air and waste management

Has Daisy worked on this and are her edits incorporated into this draft?

From: Lovell, William
Sent: Wednesday, June 28, 2017 2:12 PM
To: Dravis, Samantha <dravis.samantha@epa.gov>
Cc: Lopez, George <lopez.george@epa.gov>
Subject: RE: Gentle reminder on the article of EPA priorities in air and waste management

Samantha,

Please find attached a third draft for the AWMA article.

Best,

Will

From: Lovell, William
Sent: Friday, June 23, 2017 8:34 PM
To: Dravis, Samantha <dravis.samantha@epa.gov>
Cc: Lopez, George <lopez.george@epa.gov>
Subject: RE: Gentle reminder on the article of EPA priorities in air and waste management

Samantha,

Please find attached two rough drafts of this article written by me and Max (thanks a ton, Max!). Please note that they have the same introduction — I did not attach the wrong files! Also, they both follow the same outline: 1) Back to Basics, 2) our mandate, 3) our actions, 4) our plans.

Please let us know how else we can help with this project. I will check my work phone this weekend in case you would like something done quickly.

Best,

Will

From: Dravis, Samantha
Sent: Friday, June 16, 2017 8:20 AM
To: Lovell, William <lovell.william@epa.gov>
Subject: FW: Gentle reminder on the article of EPA priorities in air and waste management

Will,

Can you give this a shot to start putting together an outline for this article? Use the report we recently did for the Administrator on regulatory reform and energy independence – Robin should have copies!

From: John Bachmann [<mailto:johnbachmann@bellsouth.net>]
Sent: Friday, June 16, 2017 7:23 AM
To: Dravis, Samantha <dravis.samantha@epa.gov>
Subject: Gentle reminder on the article of EPA priorities in air and waste management

Hi Samantha,

Just a note to remind you that we are shooting for the end of June for your draft article.

Again, thank you so much for this important contribution to this issue.

John Bachmann

On May 24, 2017, at 10:44 AM, Dravis, Samantha <dravis.samantha@epa.gov> wrote:

Thanks, John. I haven't yet had a chance to start this, but could still try to get you something by the end of June if that is the time frame.

From: John Bachmann [<mailto:johnbachmann@bellsouth.net>]

Sent: Wednesday, May 24, 2017 10:42 AM

To: Dravis, Samantha <dravis.samantha@epa.gov>

Subject: Re: Request for an article of EPA priorities in air and waste management

Hi Samantha,

I'm just checking in to see where things stand on an article. Again, thanks for your consideration

John Bachmann

On May 2, 2017, at 11:38 AM, Dravis, Samantha <dravis.samantha@epa.gov> wrote:

Thank you for the request, John. Let me run the traps internally and see if I can write something up for you.

From: John Bachmann [<mailto:johnbachmann@bellsouth.net>]

Sent: Tuesday, May 02, 2017 10:58 AM

To: Dravis, Samantha <dravis.samantha@epa.gov>

Subject: Request for an article of EPA priorities in air and waste management

I am writing on behalf of the Air and Waste Management Association (<https://www.awma.org>), whose members consist of environmental professionals from various industries, consultants, state, local, and federal agencies, and academics. We publish a monthly e-magazine called EM, which is targeted towards environmental managers from these groups. Our September issue of EM will consist of stakeholders perspectives on the most important air and waste related management priorities for the new Administration. As is our custom for special stakeholder issues like this, we would welcome a lead article from the Environmental Protection Agency. We are also reaching out to stakeholders representing various industries, states, environmentalists, and academics.

In soliciting an EPA article for one of our stakeholder comment issues of EM, we usually work through the air or waste EPA program offices. In this search, as the head of the policy office, you were recommended as the best contact for this request. Some specifics. We are looking for an article of 2000 to 3000 words in length that focuses on EPA's priorities, particularly for air and waste management. You are free to go beyond those areas, and it could be authored by you or anyone you believe would be an appropriate to represent EPA's perspectives. We are asking authors to provide a near final draft by the end of June, but can be somewhat flexible as the normal review process does not apply for policy related opinion pieces. You would have a chance to review the galley proofs of the article before it goes to publication.

I hope you will consider our request as an opportunity to communicate directly with our members. If you have any questions in making a decision, please let me know. I'm available either through this email or by phone at 919 619-0769.

Thank you for your consideration.

John Bachmann

Vision Air Consulting, LLC

EM Editorial Board

To: Debell, Kevin[debell.kevin@epa.gov]; Bolen, Brittany[bolen.brittany@epa.gov]
From: Dravis, Samantha
Sent: Tue 5/16/2017 5:02:02 PM
Subject: RE: EPA Comments on Draft Report

Thanks Kevin. I have cancelled the OD meeting in favor of a 1:30pm meeting with the three of us, if you could come by my office then I would appreciate it.

From: Debell, Kevin
Sent: Tuesday, May 16, 2017 12:53 PM
To: Dravis, Samantha <dravis.samantha@epa.gov>; Bolen, Brittany <bolen.brittany@epa.gov>
Subject: EPA Comments on Draft Report

Hi Samantha and Brittany:

I hope everything is going well today. Attached please find a table containing EPA comments on the Department of Commerce's draft report on streamlining permitting and regulatory reform.

While the table includes a relatively large set of comments, most simply provide additional information for the sake of clarity and accuracy. The comments that suggest substantive changes to DOC's recommendations can be found in lines 24, 31, 34 through 38, and 47. In working with the programs, we have made clear that we may not wish to recommend deletion of recommended tasks and may remove those comments. You'll see several instances in which the programs provided alternate language for items they might prefer to be removed from the report.

Of course, the DOC request today may change or make moot some of the comments in this table. We will provide a draft transmittal message for the table to you later today. Please let me know if you have any questions.

Best,

Kevin

Kevin M. DeBell, Ph.D., Acting Director

U.S. Environmental Protection Agency

Office of the Administrator / Office of Policy / Office of Strategic Environmental Management

1200 Pennsylvania Avenue NW (1807T)

William Jefferson Clinton Building West, Room 4104P

Washington, DC 20460

o 202 566 1931

c 202 641 0711

debell.kevin@epa.gov

I'm always open to feedback on my performance and service. Please provide your comments here: <https://www.surveymonkey.com/r/debellfeedback>. Your comments will be provided to me anonymously.

To: Williams, Emily M.[emily.williams@sba.gov]
From: Dravis, Samantha
Sent: Fri 5/26/2017 4:04:49 PM
Subject: Re: Invitation to Advocacy's Regulatory Reform Roundtables in Louisiana

Emily,

I will have to decline this, as I will be out of town that week with the Administrator.

Thank you for the invitation.

Best,
Samantha

Sent from my iPad

On May 26, 2017, at 10:36 AM, Williams, Emily M. <emily.williams@sba.gov> wrote:

Please see attached invitation from Acting Chief Counsel Major L. Clark, III to send your RRO or a designee familiar with regulatory reform from your headquarters or a local office. The first two roundtables are scheduled for June 7 in Baton Rouge and June 8 in New Orleans.

Please let me know if you have any questions about the events.

Thanks,

Emily

Emily Mantz Williams

Outreach and Events Specialist // Acting Congressional Affairs and Public Relations
Manager

SBA // Office of Advocacy

409 3rd St. SW, Washington, D.C. 20416

<image001.png> emily.williams@sba.gov

<image002.png> 202.205.6949

<image003.png>

<image004.png><image005.png><image006.png><image007.png>

<image008.png><image009.png><image010.png>

<Invitation for Reg Roundtables - LA.pdf>

To: Kime, Robin[Kime.Robin@epa.gov]
From: Dravis, Samantha
Sent: Tue 5/16/2017 3:23:29 PM
Subject: FW: Regulatory Reform Submission After Closure of the Comment Period
[AX-17-000-8250 C&T Pesticide Policy Coalition.pdf](#)

From: Bennett, Isabella
Sent: Tuesday, May 16, 2017 10:49 AM
To: Dravis, Samantha <dravis.samantha@epa.gov>
Subject: Regulatory Reform Submission After Closure of the Comment Period
Importance: High

Good Morning Samantha,

I work in communications in the Office of Pesticide Programs (OPP). EPA received a letter on May 3rd from the Pesticide Policy Coalition. OPP would like to submit their letter as a comment to be considered in the evaluation of existing regulation and regulatory reform process, however the comment period closed on May 15th. As the contact listed in the FR I was hoping you could add the Pesticide Policy Coalition letter into the docket as a last minute submission (attached).
Docket Number: EPA-HQ-OA-2017-0190.

Thanks so much for any help you can provide on this matter.

Isabella

Isabella Bennett

Communications Services Branch

Field and External Affairs Division

Office of Pesticide Programs

703-347-0415

To: Bolen, Brittany[bolen.brittany@epa.gov]
From: Dravis, Samantha
Sent: Tue 5/2/2017 5:22:47 PM
Subject: FW: Registration Confirmation for U.S. EPA: Meeting on Regulatory Reform Agenda for Pesticides (in person)
[33781542503-622720394-inscrição.pdf](#)
[ATT00001.htm](#)

This was on our calendar, right?

From: Ferguson, Lincoln
Sent: Tuesday, May 02, 2017 12:51 PM
To: Dravis, Samantha <dravis.samantha@epa.gov>
Subject: FW: Registration Confirmation for U.S. EPA: Meeting on Regulatory Reform Agenda for Pesticides (in person)

Hey!

Just wanted to make sure you were aware of this meeting happening Thursday...a public meeting on Regulatory Reform Agenda for Pesticides.

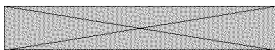
From: Clark, Krissy [<mailto:kclark@marketplace.org>]
Sent: Tuesday, May 2, 2017 12:08 PM
To: Esch, Caitlin <cesch@marketplace.org>; Daguiard, Robert <Daguiard.Robert@epa.gov>; Press <Press@epa.gov>
Subject: Fwd: Registration Confirmation for U.S. EPA: Meeting on Regulatory Reform Agenda for Pesticides (in person)

Sent from my Phone

Begin forwarded message:

From: Eventbrite <orders@eventbrite.com>
Date: April 26, 2017 at 10:57:22 AM PDT
To: "Clark, Krissy" <kclark@marketplace.org>
Subject: Registration Confirmation for U.S. EPA: Meeting on Regulatory Reform Agenda for Pesticides (in person)

Reply-To: "epa.opp.regulatoryreform@epa.gov" <epa.opp.regulatoryreform@epa.gov>

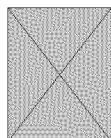


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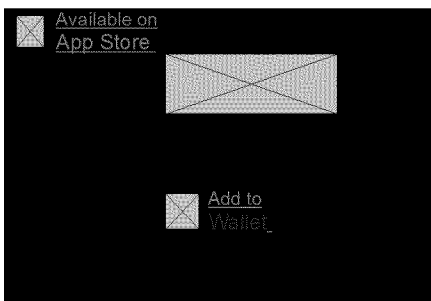
Hi krissy, this is your registration confirmation for U.S. EPA: Meeting on Regulatory Reform Agenda for Pesticides (in person)

Organized by U.S. EPA: Office of Pesticide Programs

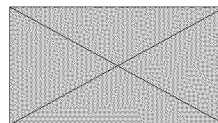
Registration summary



Mobile Summary



or



Paper Summary

Open the email attachment
or [download here](#)

Message from U.S. EPA: Office of Pesticide

Order #: 622720394

Programs

The event organizer has provided the following information:

Event Information

Thank you for registering.

Note that there are new ID requirements for visiting the Office Pesticide Programs. Under the new requirements, not all state driver's licenses qualify as valid ID. View additional information on the ID requirements, as well as information on the location of EPA's building and how to reach it by public transportation or car (<https://www.epa.gov/aboutepa/visiting-epa-headquarters>). The ID requirements are under the Building Access tab and transportation information is under the HQ Buildings in VA tab.

Please arrive in plenty of time to complete security screening before the meeting.

Have a question? [Contact the organizer](#)

Order Summary

April 26, 2017

Name	Type	Quantity
krissy clark	Attendee	1

This order is subject to Eventbrite [Terms of Service](#), [Privacy Policy](#), and [Cookie Policy](#)

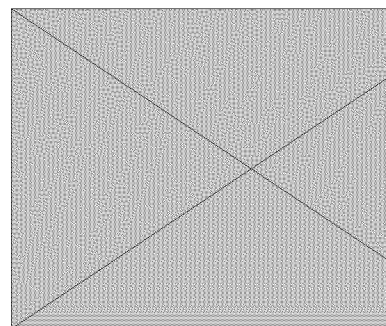
About this event

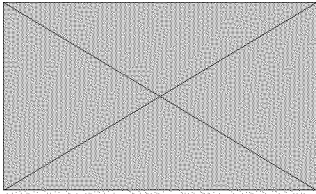
☒ Thursday, May 4, 2017 from 8:30 AM to 12:00 PM (EDT)

☒ 2777 Crystal Dr
Arlington, VA 22202

☒ Add to my calendar:

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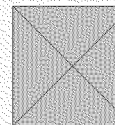
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This email was sent to kclark@marketplace.org

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From: Dravis, Samantha
Location: DCRoomARN3500/OPEI
Importance: Normal
Subject: Declined: AGA and NGVA Regulatory Reform Discussion
Categories: Record Saved - Shared
Start Date/Time: Fri 8/18/2017 6:00:00 PM
End Date/Time: Fri 8/18/2017 6:30:00 PM

To: Hope, Brian[Hope.Brian@epa.gov]
Cc: Bolen, Brittany[bolen.brittany@epa.gov]; Dickerson, Aaron[dickerson.aaron@epa.gov]; Hupp, Sydney[hupp.sydney@epa.gov]; Chmielewski, Kevin[chmielewski.kevin@epa.gov]
From: Dravis, Samantha
Sent: Fri 5/26/2017 4:04:18 PM
Subject: Re: Invitation to Advocacy's Regulatory Reform Roundtables in Louisiana

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Sent from my iPad

On May 26, 2017, at 11:38 AM, Hope, Brian <Hope.Brian@epa.gov> wrote:

Sent from my iPhone

Begin forwarded message:

From: "Williams, Emily M." <emily.williams@sba.gov>
Date: May 26, 2017 at 10:35:23 AM EDT
To: "Williams, Emily M." <emily.williams@sba.gov>
Subject: Invitation to Advocacy's Regulatory Reform Roundtables in Louisiana

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Thanks,

Emily

Emily Mantz Williams

Outreach and Events Specialist // Acting Congressional Affairs and Public

Relations Manager

SBA // Office of Advocacy

409 3rd St. SW, Washington, D.C. 20416

<image001.png>

emily.williams@sba.gov

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202.205.6949

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<image009.png>

<image010.png>

<Invitation for Reg Roundtables - LA.pdf>

To: Kime, Robin[Kime.Robin@epa.gov]
From: Dravis, Samantha
Sent: Tue 5/16/2017 3:21:09 PM
Subject: FW: Regulatory Reform Letter from Senate EPW Members
2017.05.15 Letter to Samantha Dravis from Eight Senators.pdf

From: Horner, Elizabeth (EPW) [mailto:Elizabeth_Horner@epw.senate.gov]
Sent: Monday, May 15, 2017 6:08 PM
To: Dravis, Samantha <dravis.samantha@epa.gov>
Cc: Bolen, Brittany <bolen.brittany@epa.gov>; Palich, Christian <palich.christian@epa.gov>
Subject: Regulatory Reform Letter from Senate EPW Members

Associate Administrator Dravis,

Attached is a courtesy electronic copy of a letter sent to you today by eight members of the U.S. Senate Committee on Environment and Public Works. The letter has also been submitted to regulations.gov under Docket No. EPA-HQ-OA-2017-1790.

Elizabeth L. Horner

Majority Counsel

Senate Committee on Environment and Public Works

Elizabeth_Horner@epw.senate.gov

(202) 224-7841

To: Bolen, Brittany[bolen.brittany@epa.gov]
From: Dravis, Samantha
Sent: Mon 4/17/2017 5:59:11 PM
Subject: Fwd: Permitting
[2017 04 17 Permit Streamlining Response.docx](#)
[ATT00001.htm](#)
[2017 04 17 Permit Streamlining Cover Memo Clean.docx](#)
[ATT00002.htm](#)

Sent from my iPhone

Begin forwarded message:

From: "Debell, Kevin" <debell.kevin@epa.gov>
Date: April 17, 2017 at 1:54:01 PM EDT
To: "Dravis, Samantha" <dravis.samantha@epa.gov>
Subject: Permitting

Hi Samantha:

Thanks for your patience! Attached are the latest versions of the documents. Please let me know if you think we're on the right track.

As I mentioned earlier, I think we still need to...

- ☐ ☐ ☐ ☐ ☐ ☐ ☐ Incorporate discussion of NEPA
- ☐ ☐ ☐ ☐ ☐ ☐ ☐ Be more specific about the measures we want to use to evaluate our progress
- ☐ ☐ ☐ ☐ ☐ ☐ ☐ Add in more detail about impacts of permitting
- ☐ ☐ ☐ ☐ ☐ ☐ ☐ Obtain and incorporate much more ambitious efforts from the programs
- ☐ ☐ ☐ ☐ ☐ ☐ ☐ Add discussion on (and perhaps a higher level of commitment to) retroactive review
- ☐ ☐ ☐ ☐ ☐ ☐ ☐ Continue to proofread

Thanks very much,

Kevin

Kevin M. DeBell, Ph.D.

Associate Office Director, Office of Strategic Environmental Management

Acting Division Director, Evaluation Support Division

U.S. Environmental Protection Agency

Office of the Administrator / Office of Policy

1200 Pennsylvania Avenue NW (1807T)

William Jefferson Clinton Building West, Room 4104P

Washington, DC 20460

o 202 566 1931

c 202 641 0711

debell.kevin@epa.gov

I'm always open to feedback on my performance and service. Please provide your comments here: <https://www.surveymonkey.com/r/debellfeedback>. Your comments will be provided to me anonymously.

To: Dunham, Sarah[Dunham.Sarah@epa.gov]
From: Dravis, Samantha
Sent: Tue 5/16/2017 2:39:39 PM
Subject: RE: OAR submission to EPA's Regulatory Reform Task Force per EO 13777

Thank you Sarah.

From: Dunham, Sarah
Sent: Monday, May 15, 2017 8:56 PM
To: Jackson, Ryan <jackson.ryan@epa.gov>; Dravis, Samantha <dravis.samantha@epa.gov>; Brown, Byron <brown.byron@epa.gov>; Bolen, Brittany <bolen.brittany@epa.gov>
Cc: Gunasekara, Mandy <Gunasekara.Mandy@epa.gov>; Lewis, Josh <Lewis.Josh@epa.gov>; Page, Steve <Page.Steve@epa.gov>; Grundler, Christopher <grundler.christopher@epa.gov>; Edwards, Jonathan <Edwards.Jonathan@epa.gov>; Harvey, Reid <Harvey.Reid@epa.gov>
Subject: OAR submission to EPA's Regulatory Reform Task Force per EO 13777

Please see attached OAR's EO 13777 submission for consideration by EPA's Regulatory Reform Task Force. Also attached is the transcript of the public stakeholder meeting held on April 24.

To: Gunasekara, Mandy[Gunasekara.Mandy@epa.gov]
From: Dravis, Samantha
Sent: Tue 6/20/2017 4:15:22 PM
Subject: FW: AAPCA Meeting

From: Clint Woods [mailto:cwoods@csg.org]
Sent: Tuesday, June 20, 2017 11:45 AM
To: Dravis, Samantha <dravis.samantha@epa.gov>
Cc: Bolen, Brittany <bolen.brittany@epa.gov>
Subject: RE: AAPCA Meeting

Samantha,

Thanks so much, and sorry for the delay in getting back to you. That sounds great – Depending on the timing and interest, our state & local members would be very interested in discussing any updates related to Clean Air Act issues and regulatory reform during the open session (September 21) or closed session limited to our members & EPA personnel (morning of September 22). In addition to making sure to send more information to Ken, Tate, and OCIR, we were planning to extend an invite to acting or confirmed leadership at a few program offices of interest (OAR, OECA, and ORD), as well as the air directors from regions where we expect to have several members in attendance, including Regions 3, 4, 5, 6, 8, and 9. We usually have more detailed technical updates provided by the Office of Air Quality Planning & Standards and the Clean Air Markets Division at OAR on monitoring, modeling, NAAQS, SIP, and permitting issues and, based on the location, expect good turnout from the career staff in these offices.

Happy to discuss further if a different direction makes sense – Thanks!

Clint Woods

Executive Director

Association of Air Pollution Control Agencies

1776 Avenue of the States

Lexington, KY 40511

859.244.8040 – office

cwoods@csg.org

<http://www.cleanairact.org>

From: Dravis, Samantha [<mailto:dravis.samantha@epa.gov>]

Sent: Friday, June 16, 2017 4:11 PM

To: Clint Woods

Cc: Bolen, Brittany

Subject: RE: AAPCA Meeting

Hi Clint! Good to hear from you. I would definitely be interested in seeing who you are hoping to invite from EPA HQ and the regions and having a chance to weigh in on that. From our office, I think Mandy Gunasekara, Brittany Bolen (whom you know well) and myself would have an interest in attending.

Look forward to talking soon.

Samantha

From: Clint Woods [<mailto:cwoods@csg.org>]

Sent: Friday, June 16, 2017 11:28 AM

To: Dravis, Samantha <dravis.samantha@epa.gov>

Subject: RE: AAPCA Meeting

Samantha,

I hope all is well – Our leadership was hoping to send some targeted invitations to regional and HQ EPA personnel next week, and I wanted to check to see if we needed to coordinate the outreach to staff in the Administrator's Office? We realize this a busy time and there are many competing requests - Thanks in advance!

Clint Woods

Executive Director

Association of Air Pollution Control Agencies

1776 Avenue of the States

Lexington, KY 40511

859.244.8040 – office

cwoods@csg.org

<http://www.cleanairact.org>



ASSOCIATION OF AIR POLLUTION CONTROL AGENCIES

2017 FALL BUSINESS MEETING

September 20–22 | Doubletree by Hilton | Raleigh, North Carolina

From: Clint Woods
Sent: Tuesday, May 16, 2017 2:09 PM
To: 'Dravis, Samantha'
Subject: RE: AAPCA Meeting

Samantha,

Thanks so much for following up, and we definitely understand the demands on the Administrator's schedule.

The short answer is yes, and we would welcome the chance to make sure the right staff are able to attend. In the past, we have also had the good fortune of facilitating participation or presentations at our meetings from senior career and political leadership from OAR (including acting or confirmed AA at every meeting), OECA, OGC, ORD, and relevant regional offices. One of the reasons for locating in Raleigh is to reduce barriers to attend for RTP and DC-based U.S. EPA staff. Obviously, we would welcome participation from the Administrator's Office, and understand that some non-acting program or regional office leadership may not be in place by that date.

Please let me know what we can do to help – Our members benefit from interacting with senior EPA staff, and the meeting should be a unique opportunity to hear from senior air officials from several dozen state and local agencies. Thanks again!

Clint Woods

Executive Director

Association of Air Pollution Control Agencies

1776 Avenue of the States

Lexington, KY 40511

859.244.8040 – office

cwoods@csg.org

<http://www.cleanairact.org>

From: Dravis, Samantha [<mailto:dravis.samantha@epa.gov>]

Sent: Tuesday, May 16, 2017 1:16 PM

To: Clint Woods

Subject: AAPCA Meeting

Hi Clint,

I am reaching out on behalf of Administrator Pruitt, who very much appreciates the invitation to attend AAPCA's meeting in September in Raleigh. Unfortunately, the Administrator will be unable to attend because of a scheduling conflict. I wanted to reach out and see if you would be interested in having some staff attend your event?

Thanks in advance – look forward to chatting with you soon.

Best,

Samantha

From: Dravis, Samantha
Location: DCRoomARN3500/OPEI
Importance: Normal
Subject: Regulatory Reform Meeting
Categories: Record Saved - Shared
Start Date/Time: Tue 8/8/2017 2:30:00 PM
End Date/Time: Tue 8/8/2017 3:00:00 PM

To: Kime, Robin[Kime.Robin@epa.gov]
From: Dravis, Samantha
Sent: Tue 5/2/2017 11:55:02 AM
Subject: FW: Comment for Docket ID No. EPA-HQ-OA-2017-0190
EPA Regulatory Reform Comment Cover Letter.pdf

Reg Reform

From: Laura Kate Bender [mailto:Laura.Bender@lung.org]
Sent: Monday, May 01, 2017 5:53 PM
To: Dravis, Samantha <dravis.samantha@epa.gov>; Jackson, Ryan <jackson.ryan@epa.gov>
Cc: Dunham, Sarah <Dunham.Sarah@epa.gov>
Subject: Comment for Docket ID No. EPA-HQ-OA-2017-0190

Attached please find additional comments from the American Lung Association for Docket ID No. EPA-HQ-OA-2017-0190. Thank you.

To: Bolen, Brittany[bolen.brittany@epa.gov]
From: Dravis, Samantha
Sent: Mon 4/17/2017 2:49:43 PM
Subject: FW: Permitting
2017 04 17 Permit Streamlining Response.docx
2017 04 17 Permit Streamlining Cover Memo Clean.docx

From: Debell, Kevin
Sent: Monday, April 17, 2017 10:35 AM
To: Dravis, Samantha <dravis.samantha@epa.gov>
Subject: Permitting

Hi Samantha:

I hope you had a good weekend. I'm continuing to work on the attached documents prior to our 11:30 discussion, but wanted to give you the opportunity to see where they are going. I look forward to speaking with you soon.

Best,

Kevin

Kevin M. DeBell, Ph.D.

Associate Office Director, Office of Strategic Environmental Management

Acting Division Director, Evaluation Support Division

U.S. Environmental Protection Agency

Office of the Administrator / Office of Policy

1200 Pennsylvania Avenue NW (1807T)

William Jefferson Clinton Building West, Room 4104P

Washington, DC 20460

o 202 566 1931

c 202 641 0711

debell.kevin@epa.gov

I'm always open to feedback on my performance and service. Please provide your comments here: <https://www.surveymonkey.com/r/debellfeedback>. Your comments will be provided to me anonymously.

To: Kime, Robin[Kime.Robin@epa.gov]
From: Dravis, Samantha
Sent: Tue 5/2/2017 11:54:52 AM
Subject: FW: Follow Up
Comments on Evaluation of Existing Regulations per EO 13777.pdf

Robin,

Can you start a reg reform folder in my email?

From: McGuffey, Carroll Wade [mailto:mack.mcguffey@troutmansanders.com]
Sent: Monday, May 01, 2017 5:55 PM
To: Dravis, Samantha <dravis.samantha@epa.gov>; Gunasekara, Mandy <Gunasekara.Mandy@epa.gov>; Bolen, Brittany <bolen.brittany@epa.gov>
Cc: Kelly, Kerry <KKelly5@wm.com>
Subject: RE: Follow Up

Dear Samantha, Mandy, and Brittany,

Thank you again for your continued interest in our concerns regarding the Section 111 air rules for MSW landfills. As indicated previously, we are planning to raise our concerns in comments on EPA's evaluation of existing regulations per executive order 13777. We plan to submit the comments to the docket by the deadline of May 15th, but we also thought you all might appreciate receiving a copy a bit earlier, given the time pressure I'm sure you are under with regard to these regulatory reform efforts. If you have questions, please don't hesitate to contact us at your convenience.

Mack McGuffey
TROUTMAN SANDERS
Direct: 404.885.3698 | Mobile: 770.402.0727
mack.mcguffey@troutmansanders.com

Mack McGuffey
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To: Bond, Alex[ABond@eei.org]
From: Dravis, Samantha
Sent: Mon 5/15/2017 8:03:47 PM
Subject: RE: Comments of the Edison Electric Institute

Thanks Alex.

From: Bond, Alex [mailto:ABond@eei.org]
Sent: Monday, May 15, 2017 3:58 PM
To: Rees, Sarah <rees.sarah@epa.gov>; Laws-Regs <Laws-Regs@epa.gov>
Cc: Gunasekara, Mandy <Gunasekara.Mandy@epa.gov>; Bolen, Brittany <bolen.brittany@epa.gov>; Jackson, Ryan <jackson.ryan@epa.gov>; Dravis, Samantha <dravis.samantha@epa.gov>; Brown, Byron <brown.byron@epa.gov>; Shea, Quin <QShea@eei.org>; Fisher, Emily <EFisher@eei.org>; Steckelberg, Kathy <KSteckelberg@eei.org>; Chuck Barlow - Entergy Corporation (cbarlow@entergy.com) <cbarlow@entergy.com>
Subject: Comments of the Edison Electric Institute

Dear Ms. Rees:

The Edison Electric Institute appreciates the opportunity to provide input on the Environmental Protection Agency's notice—in accordance with Executive Order (E.O.) 13777, Enforcing the Regulatory Reform Agenda—seeking comments on regulations that may be appropriate for repeal, replacement or modification. Our comments are attached here, and have also been submitted to the docket. Thank you!

--

Alex Bond

Associate General Counsel, Energy & Environment
701 Pennsylvania Avenue, N.W.
Washington, D.C. 20004-2696
202-508-5523
www.eei.org

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To: Kime, Robin[Kime.Robin@epa.gov]
From: Dravis, Samantha
Sent: Sun 6/18/2017 7:52:54 PM
Subject: RE: American Foundry Society June 21st

I see. Let them know we will follow up to confirm in the morning – and see if we can pull whatever comments AFS submitted to the regulatory reform docket. I hate to cancel last minute, but they already have time with Administrator Pruitt so it's a lot. I already have the NAM meeting and the ISRI this week.

In the meantime, I reached out to see if Nancy Beck wants to do it.

From: Kime, Robin
Sent: Sunday, June 18, 2017 3:51 PM
To: Dravis, Samantha <dravis.samantha@epa.gov>
Subject: RE: American Foundry Society June 21st

It is the broader group of members, they've asked for you speak generally on reg reform and the Administrator's priorities (5-8 minutes, nothing technical in nature). My notes for this are on your desk with the invitation.

From: Dravis, Samantha
Sent: Sunday, June 18, 2017 3:49 PM
To: Kime, Robin <Kime.Robin@epa.gov>
Subject: RE: American Foundry Society June 21st

Do we know how many people are at the breakfast and what the other details are? What are they wanting me to speak on?

We need to get a lot of specifics before accepting these.

From: Kime, Robin
Sent: Sunday, June 18, 2017 3:44 PM
To: Dravis, Samantha <dravis.samantha@epa.gov>
Subject: RE: American Foundry Society June 21st

Hi,

Thank you. Yes, they had still wanted you to speak at the breakfast (to a broader audience), in addition to participating in the smaller CEO meeting with the Administrator. I will follow-up to decline the breakfast due to scheduling.

From: A.J. Ferate [<mailto:aj@feratepllc.com>]
Sent: Sunday, June 18, 2017 3:26 PM
To: Dravis, Samantha <dravis.samantha@epa.gov>
Cc: Kime, Robin <Kime.Robin@epa.gov>
Subject: Re: American Foundry Society June 21st

I understand that your assistant and Stuart Jolley have been communicating on this matter; thank you very much. AJF

Anthony J. "A.J." Ferate, JD

(202) 486.7211 (cell)

On Jun 18, 2017, at 13:43, Dravis, Samantha <dravis.samantha@epa.gov> wrote:

AJ, I am looking at my calendar today and it looks like I've got an American Foundry Society roundtable with Pruitt scheduled (to staff him) Tuesday at 1:30pm, but I am not speaking at any breakfast. I am confirming this understanding with you that there is just the meeting with Pruitt this coming week. I don't manage Nancy's schedule so I have no idea her availability.

From: A.J. Ferate [<mailto:aj@feratepllc.com>]
Sent: Monday, June 05, 2017 12:53 PM
To: Dravis, Samantha <dravis.samantha@epa.gov>
Subject: American Foundry Society June 21st

Samantha:

I hope all is well; I wanted to see if you or Nancy might be available to speak to the

American Foundry Society meeting on the morning of June 21st there in DC?
Ideally the speech would be a high-level EPA update at a 7:30 breakfast but if that is too early we can make other arrangements.

Please let me know if this works and I will provide additional information to you.

With appreciation, A.J. Ferate

Anthony J. "A.J." Ferate, JD

(202) 486.7211 (cell)

To: McGuffey, Carroll Wade[mack.mcguddy@troutmansanders.com]; Gunasekara, Mandy[Gunasekara.Mandy@epa.gov]; Bolen, Brittany[bolen.brittany@epa.gov]
Cc: Kelly, Kerry[KKelly5@wm.com]
From: Dravis, Samantha
Sent: Tue 5/2/2017 11:54:35 AM
Subject: RE: Follow Up

Thank you.

From: McGuffey, Carroll Wade [mailto:mack.mcguddy@troutmansanders.com]
Sent: Monday, May 01, 2017 5:55 PM
To: Dravis, Samantha <dravis.samantha@epa.gov>; Gunasekara, Mandy <Gunasekara.Mandy@epa.gov>; Bolen, Brittany <bolen.brittany@epa.gov>
Cc: Kelly, Kerry <KKelly5@wm.com>
Subject: RE: Follow Up

Dear Samantha, Mandy, and Brittany,

Thank you again for your continued interest in our concerns regarding the Section 111 air rules for MSW landfills. As indicated previously, we are planning to raise our concerns in comments on EPA's evaluation of existing regulations per executive order 13777. We plan to submit the comments to the docket by the deadline of May 15th, but we also thought you all might appreciate receiving a copy a bit earlier, given the time pressure I'm sure you are under with regard to these regulatory reform efforts. If you have questions, please don't hesitate to contact us at your convenience.

Mack McGuffey
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Direct: 404.885.3698 | Mobile: 770.402.0727
mack.mcguddy@troutmansanders.com

Mack McGuffey
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To: Debell, Kevin[debell.kevin@epa.gov]
From: Dravis, Samantha
Sent: Fri 4/14/2017 3:37:02 PM
Subject: FW:
EPA Memo to Commerce Dravis Edits.docx

Work from the track changes I made in this part to further edit.

From: Dravis, Samantha
Sent: Friday, April 14, 2017 11:35 AM
To: Bolen, Brittany <bolen.brittany@epa.gov>
Subject:

Here are my initial edits just on the commerce memo part of it. Digging into the response now.
Do you just want to further add your edits into this one?

To: Rees, Sarah[rees.sarah@epa.gov]; Bolen, Brittany[bolen.brittany@epa.gov]
Cc: Kime, Robin[Kime.Robin@epa.gov]
From: Dravis, Samantha
Sent: Tue 7/25/2017 10:12:17 PM
Subject: RE: Invitation to present at the Treated Wood Council 2017 Annual Meeting

Happy to have you do it if you are interested in it, Sarah!

From: Rees, Sarah
Sent: Tuesday, July 25, 2017 5:00 PM
To: Dravis, Samantha <dravis.samantha@epa.gov>; Bolen, Brittany <bolen.brittany@epa.gov>
Cc: Kime, Robin <Kime.Robin@epa.gov>
Subject: FW: Invitation to present at the Treated Wood Council 2017 Annual Meeting

Hi folks. I've been invited to talk about EO 13777 at the Treated Wood Council's annual meeting in November. The meeting is in town (Alexandria) so no travel and minimal time. I'm happy to do it, but wanted to check in with you as to whether you'd prefer to do it or have some other thoughts as to how to proceed. Let me know.

Cheers,
Sarah

From: Miller, Jeff [mailto:Jeff_Miller@treated-wood.org]
Sent: Tuesday, July 25, 2017 4:32 PM
To: Rees, Sarah <rees.sarah@epa.gov>
Subject: Invitation to present at the Treated Wood Council 2017 Annual Meeting

Hi Sarah,

In follow-up to my voice message from earlier today, I would like to invite you (or a representative from your office) to give a presentation at the Treated Wood Council 2017 Annual Meeting. We are hoping that you could give us an update on EPA's actions under Executive Order 13777, specifically the Federal Register notice of April 13th, maybe touching on the comments submitted by the Treated Wood Council (attached).

The Meeting will be in the afternoon of Thursday, Nov. 16, 2017 at the Embassy Suites in Old Town, Alexandria, VA.

Let me know if you have any questions.

Jeff Miller

President & Executive Director

Treated Wood Council

202-641-5427

To: Paul Schlegel[pauls@fb.org]
Cc: Bolen, Brittany[bolen.brittany@epa.gov]
From: Dravis, Samantha
Sent: Mon 5/15/2017 6:27:50 PM
Subject: RE: Agriculture submission to EPA

Thank you, Paul.

From: Paul Schlegel [mailto:pauls@fb.org]
Sent: Monday, May 15, 2017 2:25 PM
To: Dravis, Samantha <dravis.samantha@epa.gov>
Cc: Bolen, Brittany <bolen.brittany@epa.gov>
Subject: RE: Agriculture submission to EPA

Samantha and Brittany –

As I mentioned last week, a broad spectrum of agricultural organizations have compiled comments for EPA's docket on regulations. I am attaching a copy of the comment letter, which was filed a short while ago.

The comments raise a number of very important issues for producers. If your schedules permit, we would welcome the chance to meet with you to reinforce their importance to our members.

Thanks very much for your willingness to look these over.

Cordially,

Paul

Paul Schlegel

Director, Energy and Environment Team

Direct: (202) 406-3687

Cell: (202) 459-8831

Email: pauls@fb.org

From: Dravis, Samantha [<mailto:dravis.samantha@epa.gov>]

Sent: Thursday, May 11, 2017 2:58 PM

To: Paul Schlegel

Cc: Bolen, Brittany

Subject: RE: Agriculture submission to EPA

Thank you, Paul. Look forward to seeing the comments.

From: Paul Schlegel [<mailto:pauls@fb.org>]

Sent: Thursday, May 11, 2017 2:41 PM

To: Dravis, Samantha <dravis.samantha@epa.gov>

Subject: Agriculture submission to EPA

Samantha –

On Monday, a large number of agricultural organizations will make a joint submission to the EPA docket EPA-HQ- OA-2017-0190. American Farm Bureau is coordinating this effort. I've included below a list of the groups currently signing onto the submission.

Once the submission is final, I would like to send you a copy. Additionally, I know we would appreciate the chance to meet with you to underscore the importance of these issues to agriculture generally. We'd be happy to work around your schedule if that is something that would be worthwhile for you.

Thanks very much, and let me know if I can answer any questions.

Paul

Paul Schlegel

Director, Energy and Environment Team

Direct: (202) 406-3687

Cell: (202) 459-8831

Email: pauls@fb.org

Groups signing onto Agriculture Regulatory Reform Submission:

-

Agri-Mark Dairy Cooperative, Inc.

American Dairy Coalition

American Farm Bureau Federation

AmericanHort

American Soybean Association

American Sugar Cane League

California Specialty Crops Council

Dairy Farmers of America

Dairy Producers of New Mexico

Dairy Producers of Utah

Exotic Wildlife Association

Federal Forest Resource Coalition

Idaho Dairymen's Association

Missouri Dairy Association

National Association of Wheat Growers

National Corn Growers Association

National Cotton Council

National Council of Agricultural Employers

National Council of Farmer Cooperatives

National Pork Producers Council

National Milk Producers Federation

National Sorghum Producers

Northeast Dairy Farmers Cooperatives

Panhandle Peanut Growers Association

Professional Dairy Managers of Pennsylvania

South East Dairy Farmers Association

Southwest Council of Agribusiness

St. Albans Cooperative Creamery

Upstate Niagara Cooperative, Inc.

US Apple Association

USA Rice

Western Peanut Growers Association

Western United Dairymen

To: votaw@khlaw.com[votaw@khlaw.com]
Bcc: Kime, Robin[Kime.Robin@epa.gov]
From: Dravis, Samantha
Sent: Mon 5/15/2017 1:26:15 PM
Subject: EPA's Regulatory Reform Agenda
Keller and Heckman FIFRA Coalition Request for Extension of Comment Peri....pdf

Dear Mr. Votaw:

Executive Order 13777 (82 FR 12285, March 1, 2017), "Enforcing the Regulatory Reform Agenda" directs federal agencies to establish a Regulatory Reform Task Force. One of the duties of the Task Force is to evaluate existing regulations and make recommendations to the agency head regarding their repeal, replacement, or modification. The EO requires EPA's Task Force to submit a progress report to the Administrator by late-May, 2017.

On March 24, 2017, EPA Administrator Pruitt issued an agency-wide memorandum on implementation of EO 13777, and directed program offices to seek public input on existing regulations. As part of that process the EPA established a 30-day public comment period, which is ending today. You have asked for an additional 30-day extension of that comment period. Unfortunately, given the fact that the Task Force needs to submit a progress report in late-May, the 30-day extension is not possible.

Because Regulatory Reform is a priority for this Administration, we are committed to making this an ongoing process. One of the Agency's most important assets is the relationship program and regional offices have with key stakeholders. EPA managers and staff are in frequent contact with the regulated community before, during and following the development of agency rules. EPA will always be interested in hearing from stakeholders regarding Regulatory Reform throughout the rulemaking process and other venues such as the Pesticide Program Dialogue Committee. And I am always interested in hearing ideas on how we can reduce burden, eliminate unnecessary requirements, and regulate more efficiently.

We look forward to receiving and considering your comments.

Sincerely,

Samantha K. Dravis

Senior Counsel/Associate Administrator

Office of Policy

1001 G Street, N.W.
Suite 500 West
Washington, D.C. 20001
tel. 202.434.4100
fax 202.434.4646

Writer's Direct Access
James G Votaw
(202) 434-4227
votaw@khlaw.com

April 26, 2017

Via Electronic Mail and Mail

Samantha K. Dravis
Regulatory Reform Officer and
Associate Administrator, Office of Policy
U.S. Environmental Protection Agency
William Jefferson Clinton Building
1200 Pennsylvania Avenue, N. W.
Mail Code: 1804A
Washington, DC 20460

Re: 30-Day Extension of Comment Period
Evaluation of Existing Regulations,
82 Fed. Reg. 17,793 (Apr. 13, 2017), Docket No. EPA-HQ-OA-2017-0190

Dear Ms. Dravis:

We represent an ad hoc coalition of companies forming to develop recommendations for the responsible repeal or modification of particular regulations issued to implement the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), and that are outdated, unnecessary, or unnecessarily burdensome or costly, including specific suggestions for repeal or modification (as applicable). This is to request a 30-day extension of the comment period. The process of bringing affected companies together, identifying and vetting the range of potential reform candidates, and developing thoughtful and appropriate, consensus reform proposals, requires significant coordinated effort among many people and is difficult to complete within the original 30-day period allowed. While work is underway to meet the original deadline, a somewhat longer comment period will provide the Agency with higher quality input from all groups and a much better basis for future decision-making. A reasonable extension is particularly appropriate here where there are no underlying legal deadlines, and EPA's substantive action on the recommendations may be months or years away. Thank you for your consideration.

Very truly yours,


James G Votaw

cc: Sara Rees
Docket No. EPA-HQ-OA-2017-0190

4818-1546-6567, v 1

To: Kime, Robin[Kime.Robin@epa.gov]
From: Dravis, Samantha
Sent: Wed 5/24/2017 6:31:02 PM
Subject: RE: FYI/no Action needed now Texas Railroad Commissioner re: 13777

Who would be your preference? I will instruct Shannon that it needs to get done.

From: Kime, Robin
Sent: Wednesday, May 24, 2017 2:28 PM
To: Dravis, Samantha <dravis.samantha@epa.gov>
Subject: RE: FYI/no Action needed now Texas Railroad Commissioner re: 13777

I am working on it but I need help – from anyone – Sandy or Tim Torma or someone on Jennie's staff, all those folks report to Shannon, can I ask her to assign someone good to help?

From: Dravis, Samantha
Sent: Wednesday, May 24, 2017 2:26 PM
To: Kime, Robin <Kime.Robin@epa.gov>
Subject: RE: FYI/no Action needed now Texas Railroad Commissioner re: 13777

We need to make sure we are cataloguing all of this correspondence and drafting responses for them.

From: Kime, Robin
Sent: Wednesday, May 24, 2017 2:24 PM
To: Dravis, Samantha <dravis.samantha@epa.gov>
Subject: FYI/no Action needed now Texas Railroad Commissioner re: 13777
Importance: High

Of all the correspondence we got today, this is not urgent but the attached letter is from a Texas Railroad Commissioner re: 13777 – not top priority, I just wanted you to be able to know about it in case it comes up in your meetings with external folks. I will add it to the others and get a draft response to you.

To: Jackson, Ryan[jackson.ryan@epa.gov]; Willis, Sharnett[Willis.Sharnett@epa.gov]
Cc: Bolen, Brittany[bolen.brittany@epa.gov]
From: Dravis, Samantha
Sent: Thur 4/13/2017 7:20:54 PM
Subject: Reg Reform Task Force Meeting - Reschedule

Hey RJ, we don't have anything pressing for you today on this. Can we reschedule?

To: Kime, Robin[Kime.Robin@epa.gov]
From: Dravis, Samantha
Sent: Wed 5/24/2017 6:25:51 PM
Subject: RE: FYI/no Action needed now Texas Railroad Commissioner re: 13777

We need to make sure we are cataloguing all of this correspondence and drafting responses for them.

From: Kime, Robin
Sent: Wednesday, May 24, 2017 2:24 PM
To: Dravis, Samantha <dravis.samantha@epa.gov>
Subject: FYI/no Action needed now Texas Railroad Commissioner re: 13777
Importance: High

Of all the correspondence we got today, this is not urgent but the attached letter is from a Texas Railroad Commissioner re: 13777 – not top priority, I just wanted you to be able to know about it in case it comes up in your meetings with external folks. I will add it to the others and get a draft response to you.

To: Germann, Sandy[Germann.Sandy@epa.gov]
Cc: Bolen, Brittany[bolen.brittany@epa.gov]; Kime, Robin[Kime.Robin@epa.gov]; Rees, Sarah[rees.sarah@epa.gov]; Nickerson, William[Nickerson.William@epa.gov]
From: Dravis, Samantha
Sent: Wed 5/24/2017 4:46:36 PM
Subject: RE: OPA request: Statement on reg reform report

Looks good to me.

From: Germann, Sandy
Sent: Wednesday, May 24, 2017 12:21 PM
To: Dravis, Samantha <dravis.samantha@epa.gov>
Cc: Bolen, Brittany <bolen.brittany@epa.gov>; Kime, Robin <Kime.Robin@epa.gov>; Rees, Sarah <rees.sarah@epa.gov>; Nickerson, William <Nickerson.William@epa.gov>
Subject: RE: OPA request: Statement on reg reform report

Hi Samantha,

Here's our proposed statement for addressing any inquiries about the report. Let us know if it looks ok.

Thanks,

Sandy

As required by EO 13777, EPA's Regulatory Reform Task Force has submitted its report to the Administrator. This internal report details the agency's progress toward improving implementation of regulatory reform initiatives and identifying regulations that are candidates for repeal, replacement, or modification.

From: Dravis, Samantha
Sent: Wednesday, May 24, 2017 9:35 AM
To: Germann, Sandy <Germann.Sandy@epa.gov>
Subject: RE: OPA request: Statement on reg reform report

Yes, thanks.

From: Germann, Sandy
Sent: Wednesday, May 24, 2017 8:39 AM
To: Dravis, Samantha <dravis.samantha@epa.gov>
Cc: Kime, Robin <Kime.Robin@epa.gov>
Subject: OPA request: Statement on reg reform report

Hi Samantha, OPA has asked for a statement following submittal of the reg reform report. OK to reach out to Sarah and Bill to draft a statement for your review?

Sandy Germann

US EPA Office of Policy

202-631-0272

germann.sandy@epa.gov

To: Bolen, Brittany[bolen.brittany@epa.gov]; Curry, Bridgid[Curry.Bridgid@epa.gov]
Cc: Rees, Sarah[rees.sarah@epamail.epa.gov]; Germann, Sandy[Germann.Sandy@epa.gov]
From: Dravis, Samantha
Sent: Tue 4/25/2017 4:23:35 PM
Subject: RE: OW reg reform website for review

Good on my end with Brittany's edits.

From: Bolen, Brittany
Sent: Tuesday, April 25, 2017 12:13 PM
To: Curry, Bridgid <Curry.Bridgid@epa.gov>
Cc: Dravis, Samantha <dravis.samantha@epa.gov>; Rees, Sarah <rees.sarah@epamail.epa.gov>; Germann, Sandy <Germann.Sandy@epa.gov>
Subject: RE: OW reg reform website for review

Hi Bridgid –

The document looks good with your edits. However, I noticed in the second paragraph, under the background section, there is a space missing after Task Force. Otherwise it's good to go.

Thanks,

Brittany

From: Curry, Bridgid
Sent: Tuesday, April 25, 2017 11:50 AM
To: Bolen, Brittany <bolen.brittany@epa.gov>
Cc: Dravis, Samantha <dravis.samantha@epa.gov>; Rees, Sarah <rees.sarah@epamail.epa.gov>; Germann, Sandy <Germann.Sandy@epa.gov>
Subject: OW reg reform website for review

Hi Brittany,

I have attached a draft of the OW website announcing call-in and webinar details for their public meeting on May 2nd. My comments are in track changes. Please let me know if you have any additional comments.

Thanks,

Bridgid

To: Chris Van Atten[vanatten@mjbradley.com]; Dunham, Sarah[Dunham.Sarah@epa.gov]
From: Dravis, Samantha
Sent: Fri 5/12/2017 6:32:19 PM
Subject: RE: Clean Energy Group

Thank you.

From: Chris Van Atten [mailto:vanatten@mjbradley.com]
Sent: Friday, May 12, 2017 2:23 PM
To: Dunham, Sarah <Dunham.Sarah@epa.gov>; Dravis, Samantha <dravis.samantha@epa.gov>
Subject: Clean Energy Group

Please find attached the comments of the Clean Energy Group on EPA's regulatory reform docket. Our comments have also been submitted to the docket. We appreciate the opportunity to comment.

Sincerely,

Christopher Van Atten

Christopher Van Atten,
Senior Vice President
M.J. Bradley & Associates LLC
47 Junction Square Drive
Concord, MA 01742
Phone: (978) 369-5533
Cell: (978) 844-3085
Fax: (978) 369-7712
<http://www.mjbradley.com>

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To: Natalie.Maciolek@kohler.com[Natalie.Maciolek@kohler.com]
Cc: Bolen, Brittany[bolen.brittany@epa.gov]
From: Dravis, Samantha
Sent: Tue 4/25/2017 4:22:23 PM

Natalie,

Robin Kime will reach out to you today to set up a meeting regarding the Clay MACT rule.

I encourage you to also take advantage of the public comment period that is open until May 15th for EPA's Regulatory Reform Task force to consider rules for review and revision.

Thanks,

Samantha

To: John Metzger[jfmetzger@mmm.com]
Cc: Paul Narog[pfnarog@mmm.com]; Kime, Robin[Kime.Robin@epa.gov]
From: Dravis, Samantha
Sent: Wed 5/24/2017 1:48:52 PM
Subject: RE: Requesting a Meeting With 3M

Happy to set up a meeting. Robin (copied) can help facilitate.

Thanks!

From: John Metzger [mailto:jfmetzger@mmm.com]
Sent: Tuesday, May 23, 2017 8:26 PM
To: Dravis, Samantha <dravis.samantha@epa.gov>
Cc: Paul Narog <pfnarog@mmm.com>
Subject: Requesting a Meeting With 3M

Dear Ms. Dravis: I spoke with you briefly after your presentation today to American Chemistry Council (ACC), and you suggested that I send you this email to request a meeting.

We would like to meet with you to discuss 3M's ideas for regulatory reform, which we provided to U. S. EPA in accordance with Executive Order 13777. A number of changes that we suggested should fit nicely the dual criteria of "timing" and "simplicity" that you spoke about during today's ACC meeting. We would especially like to discuss with you how a number of the New Source Performance Standards (at 40 C.F.R. Part 60) constrain research and development, which is the lifeblood of innovative companies such as 3M, and remedies that we believe EPA can readily put in place.

We would be pleased to meet with you at a time of your convenience after June 12. Although we can likely make any date after June 12 work, we would prefer to avoid the following dates: June 19-21, 23, and 27.

Please let me know what will work for you. Thank you again for meeting with our ACC team today.

Best regards,

John Metzger



John F. Metzger, P.E. | Sr. Environmental Specialist
3M Environment, Health, Safety and Sustainability
3M Center, 224-5W-03 | St. Paul, MN 55144-1000
Office: 651 737 3580
jfmetzger@mmm.com | www.3M.com

To: Theresa Pugh[theresapughconsulting@gmail.com]; Jackson, Ryan[jackson.ryan@epa.gov]; Dunham, Sarah[Dunham.Sarah@epa.gov]; shapiro@epa.gov[shapiro@epa.gov]; brenn.barry@epa.gov[brenn.barry@epa.gov]; Starfield, Lawrence[Starfield.Lawrence@epa.gov]; Best-Wong, Benita[Best-Wong.Benita@epa.gov]
Cc: Kapplemann, Bob[rbrtkappellemann@gmail.com]; hsills@starpower.net[hsills@starpower.net]; "amy zubaly ()"@domain.invalid["amy zubaly ()"@domain.invalid]
From: Dravis, Samantha
Sent: Fri 5/12/2017 5:58:45 PM
Subject: RE: EPA-HQ-OA-2017-0190 FMEA Submittal re Regulatory Reform (Consideration with EO 13777)

Thank you.

From: Theresa Pugh [mailto:theresapughconsulting@gmail.com]
Sent: Friday, May 12, 2017 1:04 PM
To: Dravis, Samantha <dravis.samantha@epa.gov>; Jackson, Ryan <jackson.ryan@epa.gov>; Dunham, Sarah <Dunham.Sarah@epa.gov>; shapiro@epa.gov; brenn.barry@epa.gov; Starfield, Lawrence <Starfield.Lawrence@epa.gov>; Best-Wong, Benita <Best-Wong.Benita@epa.gov>
Cc: Kapplemann, Bob <rbrtkappellemann@gmail.com>; hsills@starpower.net; "amy zubaly ()"@domain.invalid
Subject: EPA-HQ-OA-2017-0190 FMEA Submittal re Regulatory Reform (Consideration with EO 13777)

Good afternoon. These comments were submitted to www.regulations.gov (Confirmation #1k1-8wcg-9kb4) earlier today. We are submitting these on behalf of Florida Municipal Electric Association (FMEA) a few days early since we know you have a very tight deadline. My colleagues and I are happy to answer any technical questions.

Have a good weekend.

Theresa

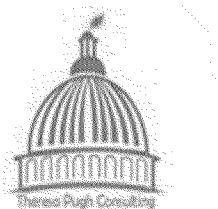
Theresa Pugh Consulting, LLC

2313 North Tracy Street

Alexandria, VA 22311

703-507-6843

www.theresapughconsulting.com



To: Kime, Robin[Kime.Robin@epa.gov]
From: Dravis, Samantha
Sent: Tue 4/25/2017 2:43:52 PM
Subject: FW: Request for Review & Meeting on EPA's Clay MACT Rule

Can you reach out to this person and get a meeting set up?

From: Bolen, Brittany
Sent: Tuesday, April 25, 2017 10:27 AM
To: Dravis, Samantha <dravis.samantha@epa.gov>
Subject: RE: Request for Review & Meeting on EPA's Clay MACT Rule

Hey, did you respond to this?

From: Bolen, Brittany
Sent: Wednesday, April 19, 2017 1:52 PM
To: Dravis, Samantha <dravis.samantha@epa.gov>
Subject: RE: Request for Review & Meeting on EPA's Clay MACT Rule

Yes.

From: Dravis, Samantha
Sent: Wednesday, April 19, 2017 1:24 PM
To: Bolen, Brittany <bolen.brittany@epa.gov>
Subject: FW: Request for Review & Meeting on EPA's Clay MACT Rule

This must be reg reform task force. Should we respond and invite her to comment in the docket?

From: Maciolek Natalie - Attorney [mailto:Natalie.Maciolek@kohler.com]
Sent: Wednesday, April 19, 2017 1:04 PM
To: Dravis, Samantha <dravis.samantha@epa.gov>
Subject: Request for Review & Meeting on EPA's Clay MACT Rule

Dear Ms. Dravis,

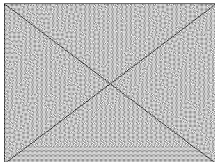
Attached is a letter requesting EPA's review of the Clay MACT Rule, as well as a request for a meeting.

Regards,

Natalie

Natalie Maciolek

Lead Attorney



Office: (920) 459-1685

Mobile: (920) 917-8948

Email: Natalie.Maciolek@kohler.com

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To: Paul Schlegel[pauls@fb.org]
Cc: Bolen, Brittany[bolen.brittany@epa.gov]
From: Dravis, Samantha
Sent: Thur 5/11/2017 6:58:28 PM
Subject: RE: Agriculture submission to EPA

Thank you, Paul. Look forward to seeing the comments.

From: Paul Schlegel [mailto:pauls@fb.org]
Sent: Thursday, May 11, 2017 2:41 PM
To: Dravis, Samantha <dravis.samantha@epa.gov>
Subject: Agriculture submission to EPA

Samantha –

On Monday, a large number of agricultural organizations will make a joint submission to the EPA docket EPA-HQ- OA-2017-0190. American Farm Bureau is coordinating this effort. I've included below a list of the groups currently signing onto the submission.

Once the submission is final, I would like to send you a copy. Additionally, I know we would appreciate the chance to meet with you to underscore the importance of these issues to agriculture generally. We'd be happy to work around your schedule if that is something that would be worthwhile for you.

Thanks very much, and let me know if I can answer any questions.

Paul

Paul Schlegel

Director, Energy and Environment Team

Direct: (202) 406-3687

Cell: (202) 459-8831

Email: pauls@fb.org

Groups signing onto Agriculture Regulatory Reform Submission:

-

Agri-Mark Dairy Cooperative, Inc.

American Dairy Coalition

American Farm Bureau Federation

AmericanHort

American Soybean Association

American Sugar Cane League

California Specialty Crops Council

Dairy Farmers of America

Dairy Producers of New Mexico

Dairy Producers of Utah

Exotic Wildlife Association

Federal Forest Resource Coalition

Idaho Dairymen's Association

Missouri Dairy Association

National Association of Wheat Growers

National Corn Growers Association

National Cotton Council

National Council of Agricultural Employers

National Council of Farmer Cooperatives

National Pork Producers Council

National Milk Producers Federation

National Sorghum Producers

Northeast Dairy Farmers Cooperatives

Panhandle Peanut Growers Association

Professional Dairy Managers of Pennsylvania

South East Dairy Farmers Association

Southwest Council of Agribusiness

St. Albans Cooperative Creamery

Upstate Niagara Cooperative, Inc.

US Apple Association

USA Rice

Western Peanut Growers Association

Western United Dairyman

To: Bolen, Brittany[bolen.brittany@epa.gov]
From: Dravis, Samantha
Sent: Tue 4/25/2017 2:43:41 PM
Subject: RE: Request for Review & Meeting on EPA's Clay MACT Rule

No not yet, sorry

From: Bolen, Brittany
Sent: Tuesday, April 25, 2017 10:27 AM
To: Dravis, Samantha <dravis.samantha@epa.gov>
Subject: RE: Request for Review & Meeting on EPA's Clay MACT Rule

Hey, did you respond to this?

From: Bolen, Brittany
Sent: Wednesday, April 19, 2017 1:52 PM
To: Dravis, Samantha <dravis.samantha@epa.gov>
Subject: RE: Request for Review & Meeting on EPA's Clay MACT Rule

Yes.

From: Dravis, Samantha
Sent: Wednesday, April 19, 2017 1:24 PM
To: Bolen, Brittany <bolen.brittany@epa.gov>
Subject: FW: Request for Review & Meeting on EPA's Clay MACT Rule

This must be reg reform task force. Should we respond and invite her to comment in the docket?

From: Maciolek Natalie - Attorney [mailto:Natalie.Maciolek@kohler.com]
Sent: Wednesday, April 19, 2017 1:04 PM
To: Dravis, Samantha <dravis.samantha@epa.gov>
Subject: Request for Review & Meeting on EPA's Clay MACT Rule

Dear Ms. Dravis,

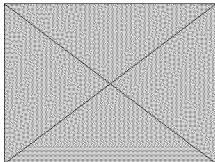
Attached is a letter requesting EPA's review of the Clay MACT Rule, as well as a request for a meeting.

Regards,

Natalie

Natalie Maciolek

Lead Attorney



Office: (920) 459-1685

Mobile: (920) 917-8948

Email: Natalie.Maciolek@kohler.com

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To: Nickerson, William[Nickerson.William@epa.gov]; Bolen, Brittany[bolen.brittany@epa.gov]
From: Dravis, Samantha
Sent: Thur 5/11/2017 6:00:39 PM
[EO 13783 Plan Dravis Edits.docx](#)
[Cover Letter with Dravis Edits.docx](#)

Brittany, can you take one more pass-through of both of my redlines and make further comments or feedback if you see things that need addressing?

Bill, can you re-circulate to the group clean copies with my edits and any further edits that Brittany has?

Thanks.

To: Kime, Robin[Kime.Robin@epa.gov]
From: Dravis, Samantha
Sent: Tue 5/23/2017 8:24:41 PM
Subject: RE: CCI and C85 Comments on the Regulatory Reform Agenda

Yes please thanks

From: Kime, Robin
Sent: Tuesday, May 23, 2017 4:09 PM
To: Dravis, Samantha <dravis.samantha@epa.gov>
Subject: FW: CCI and C85 Comments on the Regulatory Reform Agenda

Shall I make sure these are included in the docket?

From: megan.berge@bakerbotts.com [<mailto:megan.berge@bakerbotts.com>]
Sent: Monday, May 22, 2017 11:03 AM
To: Dravis, Samantha <dravis.samantha@epa.gov>
Subject: CCI and C85 Comments on the Regulatory Reform Agenda

Samantha,

Attached for your review are comments by the Class of '85 Regulatory Response Groups, which consist of more than 20 electric generating companies located throughout the country, on EPA's request for comment on regulatory reforms. We attempted to be as narrow, targeted, and specific as possible in our feedback. Please do not hesitate to contact me if you have questions or would appreciate follow up information.

Best,

Megan

Megan Heuberger Berge

Partner

BAKER BOTTS L.L.P.

The Warner | 1299 Pennsylvania Ave., NW | Washington, DC 20004

1.202.639.1308 (direct) | 1.202.256.0827 (cell)



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To: Nickerson, William[Nickerson.William@epa.gov]
From: Dravis, Samantha
Sent: Thur 5/11/2017 5:21:43 PM
Subject: RE: reading through the report now..
Cover Letter with Dravis Edits.docx

I made some add'l edits to the cover letter. Can you incorporate and recirculate them?

From: Nickerson, William
Sent: Thursday, May 11, 2017 1:17 PM
To: Dravis, Samantha <dravis.samantha@epa.gov>; Bolen, Brittany <bolen.brittany@epa.gov>; Rees, Sarah <rees.sarah@epa.gov>
Cc: Kime, Robin <Kime.Robin@epa.gov>
Subject: RE: reading through the report now..

New version of the plan attached, in redline and clean copy, that condenses the introductory material down to less than 1 page.

Latest cover letter also attached with all of Samantha's edits included, just so all the documents are in one e-mail.

From: Dravis, Samantha
Sent: Thursday, May 11, 2017 12:47 PM
To: Nickerson, William <Nickerson.William@epa.gov>; Bolen, Brittany <bolen.brittany@epa.gov>; Rees, Sarah <rees.sarah@epa.gov>
Subject: reading through the report now..

Please collapse the introduction and the Overview of EO 13783 into one section, and make it more concise. The stuff at the very beginning, is that just our editorializing, or is that a restatement of the EO? It seems like we don't need to mention that the Trump Administration is focused on energy policy that lowers costs.. since we are sending this right to them. I think we just give a brief intro and overview and launch right in.

To: Nickerson, William[Nickerson.William@epa.gov]
From: Dravis, Samantha
Sent: Tue 5/23/2017 3:16:55 PM

Can you get me some more information today on the retrospective review that took place under Obama's EO in 2011? Was there a task force, were specific deliverables requested? What, if anything came out of that process – and who led it?

Thanks in advance.

To: Kime, Robin[Kime.Robin@epa.gov]
From: Dravis, Samantha
Sent: Mon 5/22/2017 10:44:19 PM
Subject: Re: Regulatory Reform Letter from Senate EPW Members

I think Al should probably take the first stab at it

Sent from my iPad

On May 22, 2017, at 6:43 PM, Kime, Robin <Kime.Robin@epa.gov> wrote:

Hi

Is it OK if I ask Sarah/Nicole to draft a response for your review to the incoming letter?

From: Kime, Robin
Sent: Monday, May 22, 2017 2:01 PM
To: Dravis, Samantha <dravis.samantha@epa.gov>; Bolen, Brittany <bolen.brittany@epa.gov>
Subject: RE: Regulatory Reform Letter from Senate EPW Members

Definitely- my lesson learned!

From: Dravis, Samantha
Sent: Monday, May 22, 2017 2:00 PM
To: Kime, Robin <Kime.Robin@epa.gov>; Bolen, Brittany <bolen.brittany@epa.gov>
Subject: RE: Regulatory Reform Letter from Senate EPW Members

Anything of major significance also needs to be kept in my inbox before it's moved to a particular folder, to make sure I have seen it.

From: Kime, Robin
Sent: Monday, May 22, 2017 1:52 PM
To: Dravis, Samantha <dravis.samantha@epa.gov>; Lyons, Troy <lyons.troy@epa.gov>; Bolen, Brittany <bolen.brittany@epa.gov>; Bennett, Tate <Bennett.Tate@epa.gov>

Subject: FW: Regulatory Reform Letter from Senate EPW Members

It is my fault, this came in here and to the docket. I am sorry. I will figure out a new system managing our correspondence.

From: Horner, Elizabeth (EPW) [mailto:Elizabeth_Horner@epw.senate.gov]
Sent: Monday, May 15, 2017 6:08 PM
To: Dravis, Samantha <dravis.samantha@epa.gov>
Cc: Bolen, Brittany <bolen.brittany@epa.gov>; Palich, Christian <palich.christian@epa.gov>
Subject: Regulatory Reform Letter from Senate EPW Members

Associate Administrator Dravis,

Attached is a courtesy electronic copy of a letter sent to you today by eight members of the U.S. Senate Committee on Environment and Public Works. The letter has also been submitted to regulations.gov under Docket No. EPA-HQ-OA-2017-1790.

Elizabeth L. Horner

Majority Counsel

Senate Committee on Environment and Public Works

Elizabeth_Horner@epw.senate.gov

(202) 224-7841

To: Shaw, Nena[Shaw.Nena@epa.gov]
From: Dravis, Samantha
Sent: Fri 4/21/2017 8:52:27 PM
Subject: RE: EPA Response to DOC Plan to Streamline Permitting and Reduce Regulatory Burdens for Domestic Manufacturing

Thank YOU! Rest well this weekend. Great, great effort.

-----Original Message-----

From: Shaw, Nena
Sent: Friday, April 21, 2017 4:52 PM
To: Dravis, Samantha <dravis.samantha@epa.gov>
Subject: Re: EPA Response to DOC Plan to Streamline Permitting and Reduce Regulatory Burdens for Domestic Manufacturing

Thank you!

Sent from my iPhone

> On Apr 21, 2017, at 4:51 PM, Dravis, Samantha <dravis.samantha@epa.gov> wrote:
>
> RE: EPA's Input to the Department of Commerce's Plan to Streamline
> Permitting and Reduce Regulatory Burdens for Domestic Manufacturing
>
> Dear Mr. Comstock:
>
> Thank you for your leadership on the January 24, 2017 Presidential Memorandum on "Streamlining Permitting and Reducing Regulatory Burdens for Domestic Manufacturing." At the interagency coordinating meeting on March 28, 2017, participating agencies were asked to provide to the Department of Commerce responses to the following four requests: (1) Briefly describe any of your agency's reforms in progress now that pertain to this effort; (2) Provide specific regulatory reform targets regarding your Agency; (3) Provide a brief description of permitting processes related to manufacturing and describe ways they may be simplified; and (4) Other advice and input as desired.
>
> Environmental permitting can be a complex and burdensome system for domestic manufacturers to navigate as they seek to expand and create economic growth, and delays result in negative impacts for new projects and improvements manufacturers seek to make. The costs associated with environmental permitting are not well documented. The "hidden cost of environmental regulation" includes facilities that are never built and jobs never created because of environmental permitting.
>
> We can and need to do better to streamline these processes while continuing to protect human health and the environment. The process started by this Presidential Memorandum is just the beginning. In the attached Executive Summary and the body of EPA's response, we are proposing a range of reforms including modernizing the NPDES regulatory requirements consistent with CWA amendments and recent case law, as well as revising Title V regulations to streamline and clarify processes related to the submission and review of Title V petitions. These and other streamlining efforts will help provide the certainty and timeliness important for fostering an environment for economic growth. Administrator Pruitt is committed to bringing EPA back-to-basics, and streamlining our permitting processes to create economic and job growth in the manufacturing sector is crucial to that effort.
>
> I sincerely hope EPA's submission assists the Department of Commerce in developing a comprehensive Permit Streamlining Action Plan (Action Plan). If you have any questions, please feel free to contact me or Brittany Bolen at bolen.brittany@epa.gov.
> Regards,
> Samantha
>

>
> Samantha Dravis
> Senior Counsel/Associate Administrator for Policy U.S. Environmental
> Protection Agency
>
>
> <FINAL EPA Response to Commerce 4-21-2017 with appendix.pdf>

To: Breen, Barry[Breen.Barry@epa.gov]
From: Dravis, Samantha
Sent: Mon 6/26/2017 6:32:15 PM
Subject: RE: Seeking suggestions from your office by June 28 to inform the draft report under EO 13783

Thank you, Barry.

From: Breen, Barry
Sent: Monday, June 26, 2017 1:52 PM
To: Dravis, Samantha <dravis.samantha@epa.gov>
Cc: Bolen, Brittany <bolen.brittany@epa.gov>; Rees, Sarah <rees.sarah@epa.gov>; Davis, Patrick <davis.patrick@epa.gov>; Simon, Nigel <Simon.Nigel@epa.gov>; Brooks, Becky <Brooks.Becky@epa.gov>; Hilosky, Nick <Hilosky.Nick@epa.gov>; Hostage, Barbara <Hostage.Barbara@epa.gov>
Subject: RE: Seeking suggestions from your office by June 28 to inform the draft report under EO 13783

Dear Samantha,

Thank you for your note. Following up on your question who can work on this directly with Sarah, Barbara Hostage would be a great point of contact for OLEM.

Barry

From: Dravis, Samantha
Sent: Friday, June 23, 2017 1:27 PM
To: Breen, Barry <Breen.Barry@epa.gov>; Davis, Patrick <davis.patrick@epa.gov>
Cc: Jackson, Ryan <jackson.ryan@epa.gov>; Brown, Byron <brown.byron@epa.gov>; Bolen, Brittany <bolen.brittany@epa.gov>; Rees, Sarah <rees.sarah@epa.gov>
Subject: Seeking suggestions from your office by June 28 to inform the draft report under EO 13783

The following and attached information for your review is close hold. **Please do not distribute**

this. Feel free to contact me directly with any questions or concerns (564-4332).

Pursuant to Executive Order 13783, “Promoting Energy Independence and Economic Growth,” EPA is to submit a draft final report by July 26, 2017, to the Vice President, the OMB Director, the Assistant to the President for Economic Policy, the Assistant to the President for Domestic Policy, and the Chair of CEQ that includes specific recommendations that could alleviate or eliminate aspects of agency actions that burden the use or production of domestic energy.

The Regulatory Reform Task Force (RRTF) is leading the development of this report and is looking for input from your office by June 28. Specifically, we are looking for additional suggestions for changes to regulatory actions, guidance documents, policies, and similar actions, that would reduce or remove regulatory burden on domestic energy use or production, beyond actions that EPA has already publicly announced. Suggestions informed by the public meetings that were held pursuant to EO 13777 and/or comments received in the associated EPA docket would be particularly useful. You’ll find attached outlines by program area of some of the key ideas we are aware of, grouped by program office. At a minimum, the RRTF asks that your office identify several of those ideas that are the most promising, and any that are not feasible, by June 28. To the extent you identify ideas that are not feasible, please describe the specific challenge or why the idea is not feasible (e.g. requires legislation).

In order to make sure we stay on track in developing the draft report, we ask that you please identify a single staff point of contact who can work directly with Sarah Rees, the Director for the Office of Regulatory Policy and Management in OP. Thank you.

To: Dunham, Sarah[Dunham.Sarah@epa.gov]
From: Dravis, Samantha
Sent: Mon 6/26/2017 6:31:43 PM
Subject: RE: Seeking suggestions from your office by June 28 to inform the draft report under EO 13783

Thanks!

From: Dunham, Sarah
Sent: Monday, June 26, 2017 2:22 PM
To: Dravis, Samantha <dravis.samantha@epa.gov>; Gunasekara, Mandy <Gunasekara.Mandy@epa.gov>
Cc: Jackson, Ryan <jackson.ryan@epa.gov>; Brown, Byron <brown.byron@epa.gov>; Bolen, Brittany <bolen.brittany@epa.gov>; Rees, Sarah <rees.sarah@epa.gov>; Lewis, Josh <Lewis.Josh@epa.gov>
Subject: RE: Seeking suggestions from your office by June 28 to inform the draft report under EO 13783

Josh Lewis can be OAR's staff point of contact.

From: Dravis, Samantha
Sent: Friday, June 23, 2017 1:27 PM
To: Dunham, Sarah <Dunham.Sarah@epa.gov>; Gunasekara, Mandy <Gunasekara.Mandy@epa.gov>
Cc: Jackson, Ryan <jackson.ryan@epa.gov>; Brown, Byron <brown.byron@epa.gov>; Bolen, Brittany <bolen.brittany@epa.gov>; Rees, Sarah <rees.sarah@epa.gov>
Subject: Seeking suggestions from your office by June 28 to inform the draft report under EO 13783

The following and attached information for your review is close hold. **Please do not distribute this.** Feel free to contact me directly with any questions or concerns (564-4332).

Pursuant to Executive Order 13783, "Promoting Energy Independence and Economic Growth," EPA is to submit a draft final report by July 26, 2017, to the Vice President, the OMB Director, the Assistant to the President for Economic Policy, the Assistant to the President for Domestic Policy, and the Chair of CEQ that includes specific recommendations that could alleviate or

eliminate aspects of agency actions that burden the use or production of domestic energy.

The Regulatory Reform Task Force (RRTF) is leading the development of this report and is looking for input from your office by June 28. Specifically, we are looking for additional suggestions for changes to regulatory actions, guidance documents, policies, and similar actions, that would reduce or remove regulatory burden on domestic energy use or production, beyond actions that EPA has already publicly announced. Suggestions informed by the public meetings that were held pursuant to EO 13777 and/or comments received in the associated EPA docket would be particularly useful. You'll find attached outlines by program area of some of the key ideas we are aware of, grouped by program office. At a minimum, the RRTF asks that your office identify several of those ideas that are the most promising, and any that are not feasible, by June 28. To the extent you identify ideas that are not feasible, please describe the specific challenge or why the idea is not feasible (e.g. requires legislation).

In order to make sure we stay on track in developing the draft report, we ask that you please identify a single staff point of contact who can work directly with Sarah Rees, the Director for the Office of Regulatory Policy and Management in OP. Thank you.

To: Dravis, Samantha[dravis.samantha@epa.gov]
From: Bolen, Brittany
Sent: Fri 5/26/2017 4:21:16 PM
Subject: Fwd: Invitation to Advocacy's Regulatory Reform Roundtables in Louisiana
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[ATT00009.htm](#)
[image010.png](#)
[ATT00010.htm](#)
[Invitation for Reg Roundtables - LA.pdf](#)
[ATT00011.htm](#)

I may be interested in attending this.

Sent from my iPhone

Begin forwarded message:

From: "Hope, Brian" <Hope.Brian@epa.gov>
Date: May 26, 2017 at 11:38:22 AM EDT
To: "Dravis, Samantha" <dravis.samantha@epa.gov>, "Bolen, Brittany" <bolen.brittany@epa.gov>, "Dickerson, Aaron" <dickerson.aaron@epa.gov>, "Hupp, Sydney" <hupp.sydney@epa.gov>, "Chmielewski, Kevin" <chmielewski.kevin@epa.gov>
Subject: Fwd: Invitation to Advocacy's Regulatory Reform Roundtables in Louisiana

Sent from my iPhone

Begin forwarded message:

From: "Williams, Emily M." <emily.williams@sba.gov>
Date: May 26, 2017 at 10:35:23 AM EDT
To: "Williams, Emily M." <emily.williams@sba.gov>

Subject: Invitation to Advocacy's Regulatory Reform Roundtables in Louisiana

Please see attached invitation from Acting Chief Counsel Major L. Clark, III to send your RRO or a designee familiar with regulatory reform from your headquarters or a local office. The first two roundtables are scheduled for June 7 in Baton Rouge and June 8 in New Orleans.

Please let me know if you have any questions about the events.

Thanks,

Emily

Emily Mantz Williams

Outreach and Events Specialist // Acting Congressional Affairs and Public Relations Manager

SBA // Office of Advocacy

409 3rd St. SW, Washington, D.C. 20416



INVITATION

May 25, 2017

To: Federal Agency Heads
Regulatory Policy Officers
Regulatory Reform Officers

From: The Office of Advocacy, U.S. Small Business Administration

Subject: Regional Regulatory Reform Roundtables, June 7 and 8, 2017

President Trump's executive orders on regulatory reduction and reform have charged federal agencies with reviewing and eliminating regulations that stall job creation and impose undue costs.¹ As your agency embarks on regulatory reform in compliance with these executive orders, it is important that you take small businesses into consideration.

The Office of Advocacy, the voice of small business in the federal government, strongly endorses these principles. Advocacy urges agencies to review existing regulations under the executive orders in compliance with the Regulatory Flexibility Act, which requires agencies to consider the impact of regulations on small entities.

To gather direct input from small businesses, Advocacy is convening a series of Regulatory Reform Roundtables around the country. These public events are a key opportunity for regulators to hear directly from small businesses that must comply with existing regulations. They are in a unique position to discuss how outdated or duplicative rules negatively affect their ability to compete in the marketplace. Participation by agency officials—especially Regulatory Reform Officers and Regulatory Policy Officers—will be crucial to the regulatory reduction effort.

We hope your agency will send a designee familiar with regulatory policy to hear directly from small businesses, since your agency's regulations may be identified for reform. This representative can be from your headquarters or local office. The first two roundtables are scheduled for June 7 in Baton Rouge and June 8 in New Orleans. Click on the links below to view the draft agendas and to register:

¹EO 13771, Reducing Regulation and Controlling Regulatory Costs. The White House, Office of the Press Secretary (January 30, 2017), [*Presidential Executive Order on Reducing Regulation and Controlling Regulatory Costs*](#).

EO 13777, Enforcing the Regulatory Reform Agenda. The White House, Office of the Press Secretary (February 24, 2017), [*Presidential Executive Order on Enforcing the Regulatory Reform Agenda*](#).



409 3rd Street, SW / MC 3114 / Washington, DC 20416 / 202 -205-6533 ph / 202-205-6928 fax
www.sba.gov/advocacy

Baton Rouge Regulatory Reform Roundtable

June 7, 8am-5pm

Louisiana Association of Business and Industry Conference Center
3113 Valley Creek Drive, Baton Rouge, LA 70808

New Orleans Regulatory Reform Roundtable

June 8, 8am-1pm

New Orleans Marriott
555 Canal Street, New Orleans, LA 70130

The roundtables provide an opportunity for small business leaders to educate the Office of Advocacy and federal agencies through firsthand accounts of how federal regulations affect their small business. This information will be utilized to inform agencies, Congress and the public on what specific regulations can be modified or removed to help small businesses.

We hope your agency will send key officials to these important gatherings. Additional roundtables are being planned for other states and regions in coming months. For more information contact Emily Williams, Outreach and Event Specialist, Emily.Williams@sba.gov, 202-205-6533.

Congress established the Office of Advocacy under Pub. L. No. 94-305 to advocate the views of small entities before federal agencies and Congress. The Regulatory Flexibility Act (RFA) gives small entities (businesses, organizations, and local governments) a voice in the federal rulemaking process and requires agencies to consider the impacts of their rulemakings on small entities. The RFA requires Advocacy to monitor agency compliance with it. Because Advocacy is an independent office within the U.S. Small Business Administration, the views expressed by Advocacy do not necessarily reflect the position of the Administration or the SBA (15 U.S.C. § 634a, et. seq.).

To: Dravis, Samantha[dravis.samantha@epa.gov]; Bolen, Brittany[bolen.brittany@epa.gov]; Dickerson, Aaron[dickerson.aaron@epa.gov]; Hupp, Sydney[hupp.sydney@epa.gov]; Chmielewski, Kevin[chmielewski.kevin@epa.gov]

From: Hope, Brian

Sent: Fri 5/26/2017 3:38:22 PM

Subject: Fwd: Invitation to Advocacy's Regulatory Reform Roundtables in Louisiana

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[image010.png](#)

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[Invitation for Reg Roundtables - LA.pdf](#)

[ATT00011.htm](#)

Sent from my iPhone

Begin forwarded message:

From: "Williams, Emily M." <emily.williams@sba.gov>

Date: May 26, 2017 at 10:35:23 AM EDT

To: "Williams, Emily M." <emily.williams@sba.gov>

Subject: Invitation to Advocacy's Regulatory Reform Roundtables in Louisiana

Please see attached invitation from Acting Chief Counsel Major L. Clark, III to send your RRO or a designee familiar with regulatory reform from your headquarters or a local office. The first two roundtables are scheduled for June 7 in Baton Rouge and June 8 in New Orleans.

Please let me know if you have any questions about the events.

Thanks,

Emily

Emily Mantz Williams

Outreach and Events Specialist // Acting Congressional Affairs and Public Relations
Manager

SBA // Office of Advocacy

409 3rd St. SW, Washington, D.C. 20416

To: Williams, Emily M.[emily.williams@sba.gov]
From: Williams, Emily M.
Sent: Fri 5/26/2017 2:35:23 PM
Subject: Invitation to Advocacy's Regulatory Reform Roundtables in Louisiana
Invitation for Reg Roundtables - LA.pdf

Please see attached invitation from Acting Chief Counsel Major L. Clark, III to send your RRO or a designee familiar with regulatory reform from your headquarters or a local office. The first two roundtables are scheduled for June 7 in Baton Rouge and June 8 in New Orleans.

Please let me know if you have any questions about the events.

Thanks,

Emily

Emily Mantz Williams

Outreach and Events Specialist // Acting Congressional Affairs and Public Relations Manager

SBA // Office of Advocacy

409 3rd St. SW, Washington, D.C. 20416

✉ emily.williams@sba.gov

☎ 202.205.6949







NanoManufacturing Association

April 13, 2017

The Honorable Scott Pruitt
Administrator
U.S. Environmental Protection Agency
1200 Pennsylvania Ave., N.W.
Washington, D.C. 20460

Re: Request for Agency Stay of Rule Pending Guidance; Chemical
Substances When Manufactured or Processed as Nanoscale Materials;
TSCA Reporting and Recordkeeping Requirements, 82 Fed. Reg. 3641
(January 12, 2017)

Dear Administrator Pruitt:

The Nanomanufacturing Association (NMA) is an alliance of private companies and trade associations established to advocate for a responsible and reasonable regulatory climate for U.S. products in which nanomaterials are used or are essential.¹ NMA respectfully requests that the U.S. Environmental Protection Agency (EPA) stay the effective date of the final rule entitled Chemical Substances When Manufactured or Processed as Nanoscale Materials; TSCA Reporting and Recordkeeping Requirements (hereinafter the "Nanoscale Reporting Rule"), published in the Federal Register on January 12, 2017. NMA requests a meeting at your earliest convenience to discuss the need to stay this rule.

The final Nanoscale Reporting Rule indicated that EPA intends to issue guidance within six months of issuing the rule (by July 2017), which could be months after the May 12 effective date, and NMA requests that this rule be stayed at least until the guidance is issued. Issuing a stay of this rule is consistent with the Trump Administration's policy of reviewing previously issued regulations, as outlined in the January 20, 2017 Priebus Memorandum. That Memorandum instructed the heads of all executive agencies to extend the effective date for 60 days for rules that have been published in the Federal Register but not yet taken effect, which includes the Nanoscale Reporting Rule. Furthermore, a stay is necessary because NMA and its members are concerned that the Administration's April 5 guidance on implementing the January 30, 2017 Presidential Executive Order on Reducing Regulation and Controlling Regulatory Costs (Executive Order (E.O.) 13771), which clarifies that "substantial guidance" is within its scope, will cause further delays in EPA issuing

¹ For more information, visit our website at: <http://www.nanomanufacturingassociation.com/about-1.html>



guidance on the Nanoscale Reporting Rule, which would leave companies in the dark about compliance with the rule for even longer.

NMA continues to have serious reservations with this rule, which was issued in the final days of the Obama Administration over numerous objections to the rule's lack of clarity in many key aspects. Unless the effective date is extended, companies will be forced to comply with reporting requirements that – by EPA's own admission – are not clear and warrant the issuance of further guidance.

While companies who are already on the market do not have to report until 2018, starting on May 12, 2017, new market entrants must submit detailed reports before they can commercialize a nanomaterial. This rule is expected to impact business development and will require greater control over product distribution.

By EPA's own estimate, over half of the companies faced with this reporting burden are small businesses. Processors that have never had to submit these types of reports under TSCA comprise another significant segment of the companies affected by the rule. It is unreasonable to require these companies to report before the promised guidance is issued. As consistently reflected in the public comments on this rulemaking, the agency has failed to provide industry with a clear understanding of the substances that are subject to reporting. For example, in response to industry requests to provide exemptions for low risk products such as polymers and pigments, EPA simply withdrew the exemptions it had proposed so that reporting is exclusively based on subjective concepts that are open to challenge by EPA and that will result in uneven reporting, such as company intent and whether the reportable substance contributes one or more "unique and novel" properties.

Delaying the effective date until July 2017 or later complies with the Administration's directive and provides the EPA with additional time to consider the substantial questions of law and policy this Rule raises, such as:

- May EPA ignore the statutory directive that warns against imposing duplicative reporting requirements on processors?
- Why does the wording of the final rule fail to carry out EPA's stated intent to let companies go to market as soon as these filings are made?
- Why did EPA create a permanent reporting regime unique for nanomaterials against the express directive of the *Policy Principles for the U.S. Decision-Making Concerning Regulation and Oversight of Applications of Nanotechnology and Nanomaterials* issued by the Office of Science and Technology Policy on June 9, 2011?



- Why do companies believe they have to test before making these reports, even though EPA stated it did not intend to require any new testing in this rule and does not have this authority in section 8(a) of TSCA?
- Why didn't EPA provide the public with an opportunity to comment on the definition of "unique and novel properties" that fundamentally underpins the need to submit reports under the rule, or fix other areas of definition ambiguity (e.g., reportable substances) identified by the public.
- Why does the rule use the same "small business" definition that EPA previously acknowledged is out-of-date, subjecting many small businesses who should not have to report to the notification requirements of the rule?²

NMA thinks this rule should be reviewed for consistency with the Administration's regulatory reform goals. We also believe the rule is a poorly designed and written regulation that would be a good candidate for rescission under Executive Order 13371. NMA asks that this rule be stayed until July 2017 or longer to provide EPA with time to examine this rule and consider whether its burdens are warranted. Please contact me with any questions you may have.

Respectfully Submitted,

John W. Hilbert III
NanoManufacturing Association
1776 K Street NW
Washington, DC 20006
jhilbert@khaconsultants.com

cc: Martha Marrapese, Counsel to NMA with Wiley Rein LLP
Michael Flynn, Acting Deputy Administrator, EPA
John Reeder, Acting Chief of Staff, EPA
Wendy Cleland-Hamnett, Acting Assistant Administrator, Office of Chemical Safety and Pollution Prevention (OCSPP)
Jeffrey Morris, Acting Director, Office of Pollution Prevention and Toxics (OPPT)
Maria Doa, Ph.D., Director, Chemical Control Division (CCD), OPPT
Raymond J. Alwood, CCD, OPPT

² Notice; Environmental Protection Agency; TSCA Reporting and Recordkeeping Requirements; Standards for Small Manufacturers and Processors, 81 Fed. Reg. 90840, 90842 (Dec. 15, 2016).

Job Title: Associate Director - Regulatory Reform
File As: Loyola, Mario
E-mail: mario.a.loyoia@ceq.eop.gov
Display As (E-mail): Mario Loyola (mario.a.loyoia@ceq.eop.gov)
Business Address: 730 Jackson Place, NW
Washington, DC 20503
Business Telephone Number: 202-456-4593 (0)
Mobile Telephone Number: (202) 881-8958
First: Mario
Family: Loyola

To: AO OPA OMR CLIPS[AO_OPA_OMR_CLIPS@epa.gov]
From: McGonagle, Kevin
Sent: Fri 5/26/2017 3:46:52 PM
Subject: BNA: EPA, Energy Among Few Agencies Complying With Regulatory Order, 5/26/17

BNA

<https://www.bna.com/epa-energy-among-n73014451569/>

EPA, Energy Among Few Agencies Complying With Regulatory Order

By Madi Alexander and Cheryl Bolen 5/26/17

The environmental and energy agencies appear to be far ahead of other federal agencies in complying with executive orders signed months ago by President Donald Trump, aimed at repealing or streamlining regulations, according to data compiled by Bloomberg BNA.

Executive branch departments and agencies were required to appoint by April 25 a regulatory reform officer (RRO) and members of a Regulatory Reform Task Force under Executive Order 13,777, "Enforcing the Regulatory Reform Agenda." By May 25, each task force was required to provide a report to its agency head detailing the agency's progress toward identifying regulations for repeal, replacement, or modification.

The top 10 executive branch departments and agencies that issued the most regulations last year were contacted by Bloomberg BNA about the status of their task forces and progress reports. Of those, the Environmental Protection Agency and the Department of Energy appeared to be the furthest along in the process.

The EPA moved quickly and openly in March to appoint a regulatory officer and members of its task force, and has already called for public comment. Other agencies, such as the Department of Veterans Affairs, sent a redacted memorandum about its task force in response to a Freedom of Information Act request.

No Word From Most Regulators

Most agencies, including the Department of Health and Human Services, which is the top federal regulator, didn't respond to requests for information from Bloomberg BNA. The Food and Drug Administration referred questions about its compliance to the White House. An EPA spokesperson confirmed its task force would meet the May 25 deadline for submitting its report to the administrator.

A Department of Education spokesman said Robert Eitel, an aide to the secretary, and Elizabeth McFadden, deputy general counsel, had been appointed co-chairmen of its Regulatory Reform Task Force. The task force report was being finalized and would be submitted on time, he said.

The Department of Energy has appointed Brian McCormack, chief of staff, as its regulatory officer, and Daniel Simmons as chairman of its Regulatory Reform Task Force, a department spokesperson said. The task force planned to submit its progress report to the secretary by the end of the day May 25, she said.

In addition, on May 30, the Department of Energy will publish a notice in the Federal Register soliciting comment from the public on improvements to its regulations, the spokesperson said.

Additional Pressure on Energy Agencies

The environmental and energy agencies are under additional pressure to comply because of similar provisions in EO 13,783, "Promoting Energy Independence and Economic Growth."

That order requires the head of each agency to review all of that agency's existing regulations, orders, guidance documents, and policies that potentially burden the development or use of domestically produced energy resources—with particular attention to oil, natural gas, coal, and nuclear energy resources.

Under EO 13,783, the head of each affected agency was required to submit a plan to implement the order by May 12 to the director of the Office of Management and Budget.

According to OMB guidance, affected agencies were encouraged to coordinate their compliance with the relevant regulatory sections of both EO 13,783 and EO 13,777.

No Rollbacks Requested

While regulatory task forces are in progress at other agencies, the EPA already has begun to take action in response to EO 13,777, said Matthew Gravatt, associate legislative director, federal & administrative advocacy at the Sierra Club.

The EPA announced in a press release on April 11 that it was soliciting public comments on its evaluation of existing regulations. EPA's docket, which closed May 15, has to date received 183,223 comments from the public.

Sierra Club submitted comments and worked to get supporters and activists to submit comments as well, Gravatt told Bloomberg BNA. Overwhelmingly, the public comments received to date are in support of environmental rules and against rolling them back, he said.

"Folks are saying, 'My kid has asthma. These clean air protections are important. They mean a lot to me,'" he said. "'We need them.'"

Process Shortchanged

Despite drawing thousands of comments, EPA's process has not been particularly open and transparent, Gravatt said.

EPA approached this process by holding a couple of teleforums and public meetings, which were relatively limited in scope and open for only a short time, he said. The meetings were all held in the Washington, D.C., area, which deprived the broader community of the opportunity to participate, he said.

Primarily the process shortchanged the people most affected by these regulations, including those living next to power plants and generation facilities that produce harmful emissions and pollution, Gravatt said.

“You can’t say that you’re identifying and creating a place for the public to weigh in if your process doesn’t allow that to happen,” he said.

Reaction Uncertain

What the EPA does with these public comments is now up to the agency, Gravatt said.

The process, however, “seems almost engineered” to collect and solicit comments from industry and trade associations representing the companies subject to these regulations, he said.

Still, the EPA said in its public notice that the agency would be listening to those directly impacted by regulation and learning ways it can work with state and local partners to ensure clean air and water to Americans, Gravatt said.

“Well, those folks are the ones who are weighing in, and they’re saying these [regulations] matter,” he said. “Don’t roll them back.”

Kevin McGonagle

Office of Media Relations Intern

U.S. Environmental Protection Agency

Telephone: (202)-564-4524

mcgonagle.kevin@epa.gov



URANIUM PRODUCERS OF AMERICA

141 EAST PALACE AVENUE, POST OFFICE BOX 669, SANTA FE, NEW MEXICO 87504-0669
TELEPHONE (505) 982-4611; FAX (505) 988-2987; WWW.URANIUMPRODUCERSAMERICA.COM

May 8, 2017

The Honorable Scott Pruitt
Administrator, Environmental Protection Agency
1200 Pennsylvania Avenue NW
Washington, DC 20004

Dear Administrator Pruitt,

On behalf of the Uranium Producers of America (UPA), thank you for your willingness to listen to stakeholders as you review existing regulations at the Environmental Protection Agency (EPA).

The UPA is a trade association representing the domestic uranium industry, which is committed to responsible, environmentally sound production practices, both before, during, and after mining operations. However, there are several EPA regulations that should be revisited or eliminated to ensure our industry can remain productive and competitive in this global market.

We are writing to request a meeting to discuss EPA policies that have a direct impact on our industry. The leadership of the domestic uranium companies are available to be in Washington, D.C. in late May or in early June.

Thank you in advance for your consideration.

Respectfully submitted,

A handwritten signature in black ink, which appears to read 'Jon J. Indall'.

Jon J. Indall
Counsel for UPA

To: Jackson, Ryan[jackson.ryan@epa.gov]; Greenwalt, Sarah[greenwalt.sarah@epa.gov]
From: Coyner, Emily W.
Sent: Thur 5/25/2017 6:08:44 PM
Subject: Thank you for meeting with NSSGA

Ryan and Sarah,

Thanks so much for meeting with us on Tuesday with Administrator Pruitt. We appreciate the effort you are putting into fixing the Waters of the U.S. rule and general regulatory reform. We look forward to commenting positively on the WOTUS withdrawal. Please let us know if we can be of assistance on this issue, particulate matter, conductivity, or our other issues. Thanks again.

Emily W. Coyner, P.G.

Director, Environmental Policy

National Stone, Sand, and Gravel Association

66 Canal Center Plaza, Suite 300

Alexandria, VA 22314

703 526-1064/CELL 703 772-2499

www.nssga.org

To: Gunasekara, Mandy[Gunasekara.Mandy@epa.gov]; Jackson, Ryan[jackson.ryan@epa.gov]
From: Holland, Luke (Inhofe)
Sent: Wed 5/24/2017 10:58:43 PM
Subject: FW: Letter to President Trump on Climate
2017.05.25 Inhofe-Barrasso Letter to President on Paris Agreement.pdf

FYI

From: Holland, Luke (Inhofe)
Sent: Wednesday, May 24, 2017 6:58 PM
To: 'Swonger, Amy H. EOP/WHO' <Amy.H.Swonger@who.eop.gov>
Cc: Russell, Richard (EPW) <Richard_Russell@epw.senate.gov>; Forbes, Andrew (Inhofe) <Andrew_Forbes@inhofe.senate.gov>
Subject: Letter to President Trump on Climate

Amy-

Please see the attached letter to the President from Sens. Inhofe, Barrasso, and 20 others thanking him for all of his work on regulatory reform and encouraging him to make a clean exit from the Paris Agreement.

Thanks,

Luke

Luke Holland

Chief of Staff

Office of U.S. Senator James M. Inhofe

(p) 202-224-4721

To: AO OPA OMR CLIPS[AO_OPA_OMR_CLIPS@epa.gov]
From: So, Katherine
Sent: Thur 6/1/2017 2:09:44 PM
Subject: InsideEPA: Eyeing planned budget cuts, states identify dozens of EPA rules to scrap, 6/1/17

InsideEPA

<https://insideepa.com/daily-news/eying-planned-budget-cuts-states-identify-dozens-epa-rules-scrap>

Eyeing planned budget cuts, states identify dozens of EPA rules to scrap

By Amanda Palleschi 5/31/17

State officials are urging EPA to “repeal, replace or modify” scores of federal rules, steps that if adopted would ease states' abilities to implement federal requirements as they weigh plans to slim their programs to absorb the Trump administration's proposed budget cuts in fiscal year 2018.

In comments submitted to EPA earlier this month, state regulators and attorneys general charged that many of the rules they identified for overhaul are duplicative of existing state requirements, outdated, unclear, hinder infrastructure development or hamper state flexibility, among other things.

“As states have daily experiences with the complexity of the federal environmental regulatory system, we are well positioned to offer suggestions for regulatory reform, modernization, and streamlining,” Alex Dunn, executive director of the Environmental Council of the States (ECOS), said in [May 15 comments](#) to EPA.

ECOS and other state officials submitted the comments to an EPA regulatory reform task force that is reviewing existing rules for overhaul. The task force was created in response to President Donald Trump's Executive Order (EO) 13777, which is broadly intended to enforce the administration's deregulatory agenda.

In addition to identifying existing rules for overhaul or rescission, the administration is also proposing to slash EPA's budget by more than \$2 billion or 31 percent in FY18. This includes a

reduction in categorical grants for states to implement federal programs from \$1.08 billion in FY17 down to \$597 million, a cut of \$482 million.

The agency's budget justification says it plans to “eliminate or substantially reduce federal investment in state environmental activities that go beyond EPA's statutory requirements.”

In response, state officials are signaling a willingness to cut or significantly scale back their environmental programs in order to absorb EPA's proposed cut, with some states even weighing returning delegated EPA programs back to the agency.

Cuts to categorical grants would “have some profound impacts” on implementation of Clean Air Act programs in particular, Delaware's environment secretary Shawn Garvin told a May 23 event hosted by the American Bar Association.

In addition to cutting their own programs, state officials are also identifying a host of EPA rules for overhaul that would further help them as they scale back their environmental programs.

ECOS, for example, identified 19 rules or policies across the spectrum of EPA's authorities for overhaul -- the majority of which it asks EPA to consider eliminating due to overlapping state requirements.

Many call for eliminating requirements, particularly administrative reporting requirements, that ECOS says are tasks states are already completing.

For example, ECOS asks EPA to eliminate reporting requirements for the Superfund program's cooperative Agreements for Superfund Response Actions in state contracts. ECOS says that that the regulation “contains detailed requirements for the content of these reports” and that “state staff are already in regular communication with EPA staff on the work being done under these grants and agreements, making these detailed reports unnecessarily burdensome.”

RCRA Requirements

The group makes a similar case for state hazardous waste programs under the Resource Conservation and Recovery Act (RCRA), saying that EPA should reevaluate the program's permit modification classification limits, since current limits require a facility to hold a public meeting and provide opportunity to comment on proposed modifications -- yet states report that the public rarely takes advantage of such meetings: “Based on state experiences, the public almost never attends these public meetings on proposed class 2 modifications and the states rarely receive public comments. The meetings end up being a waste of time and resources.”

“ECOS believes that many modifications could be assigned a lower classification, making the permit modification process more efficient, timely and responsive to facility needs,” the group writes, but adds that EPA could include a RCRA provision that instead requires public hearings only when the public requests it.

And states complain that state duplication is an issue in EPA review of underground injection control (UIC) regulations for certain wells under the Safe Drinking Water Act (SDWA). ECOS recommends that EPA review the rules because before they were promulgated, “some states had already prioritized types of UIC wells that pose the most significant risk to groundwater sources of drinking water.”

“Now, many of the provisions of the federal regulations are duplicative of state programs, particularly the inventory requirement.”

Other requirements ECOS calls “burdensome or unclear” -- and ripe for removal -- in its comments include the SDWA Total Coliform Rule, SDWA Consumer Confidence Reports, the Clean Air Act's “once in, always in” policy, the Clean Water Act (CWA)'s sewage overflow regulations, RCRA authorization of state waste programs and its hazardous waste rules and regulations.

Rules ECOS classifies as “opportunities to modify requirements” and “advance state flexibility” include: state assumption of 404 permitting authority under the CWA; SDWA's disinfection byproducts rule; SDWA's maximum residual disinfectant level reporting; SDWA's lead and copper rule, CWA's National Pollutant Discharge Elimination System permitting program's electronic reporting rules; RCRA's Underlying Hazardous Constituent Land Disposal Restriction Regulations, and the Clean Air Act's maintenance area monitoring requirements program.

The group also asks EPA to work with congressional appropriators to eliminate “set-asides” in the state and tribal assistance grants (STAG) funding program, “unless the set-asides are made with state concurrence and support joint priorities.”

“Set-asides of existing funding reduce the ability of states to continue to implement environmental programs in the manner in which they deem appropriate.”

Several other states, as well as many state attorneys general, identified many of the same rules as ECOS.

For example, state attorneys general from Michigan, South Carolina, Oklahoma and Louisiana, in [a joint letter](#), recommended that EPA “review and streamline” the CWA section 404 program, and “review and revise” regulations to improve the State Implementation Plan (SIP) approval process, particularly for their state's attainment of Clean Air Act National Ambient Air Quality Standards (NAAQS).

And Wyoming's Department of Environmental Quality also recommends that EPA rework its selenium water quality criteria and remand its uranium criteria.

The Oklahoma Department of Environmental Quality targets EPA's Disinfection Byproducts rule, its effluent limitation guidelines for dental amalgam, and what is known as the “sensitive scientific method rule” -- which it says requires “more state and private laboratory involvement” prior to rulemaking. -- *Amanda Palleschi* (apalleschi@iwpnews.com)

Katherine So

Office of Media Relations Intern

U.S. Environmental Protection Agency

Telephone: (202)-564-4511

so.katherine@epa.gov

To: AO OPA OMR CLIPS[AO_OPA_OMR_CLIPS@epa.gov]
From: Sparacino, Jessica
Sent: Wed 8/23/2017 5:49:14 PM
Subject: The Hill: Green group sues EPA for information on deregulatory task force, 8/23/17

The Hill

<http://thehill.com/regulation/court-battles/347667-green-group-sues-for-information-on-deregulatory-task-force>

Green group sues EPA for information on deregulatory task force

By: Lydia Wheeler, 8/23/17, 1:29 p.m.

The Southern Environmental Law Center (SELC) is suing the Environmental Protection Agency (EPA) for allegedly failing to respond to the group's request for documents pertaining to its regulatory reform task force.

In a complaint filed in a U.S. district court in Virginia, the SELC claims the EPA missed the statutory deadline to respond to the Freedom of Information Act request the organization filed in April for information relating to the deregulatory panel.

Trump issued an executive order in February directing each agency to evaluate existing regulations and make recommendations to the agency head regarding their repeal, replacement or modification, consistent with applicable law.

SELC argues the order goes hand in hand with Trump's February order directing agencies to repeal two rules for every new rule issued. The group said that since EPA Administrator Scott Pruitt was confirmed, the agency has already attempted to delay or reverse key environmental protections.

"EPA's protections for air, water, and public health are critical to SELC's mission," SELC said in its 11-page complaint.

"To advocate for the people and natural resources of the Southeast, SELC requires prompt and full information on EPA actions to weaken or undo these protections."

SELC has asked the court to force EPA to turn over all nonexempt documents that have been requested.

Jessica Sparacino

US Environmental Protection Agency

Office of Public Affairs Intern

(202) 564-5327

WJCN 2502J

To: Jackson, Ryan[jackson.ryan@epa.gov]
From: Bowman, Liz
Sent: Fri 6/16/2017 9:38:23 PM
Subject: FW: NYT/ProPublica inquiry on Regulatory Task Forces, Deadline Wednesday

For your awareness...I will work on a response to this over the weekend and touch base with you on Monday.

From: Robert Faturechi [mailto:Robert.Faturechi@propublica.org]
Sent: Friday, June 16, 2017 5:12 PM
To: Bowman, Liz <Bowman.Liz@epa.gov>
Cc: Ivory, Danielle <danielle.ivory@nytimes.com>
Subject: NYT/ProPublica inquiry on Regulatory Task Forces, Deadline Wednesday

Hi Liz,

As you know, Danielle Ivory and I are working on a story for The New York Times and ProPublica about the regulatory reform task forces that have been created at several major agencies, based on President Trump's executive order. Through interviews, public records and Freedom of Information Act requests, we have identified many of the members of these task forces and have found that some may be reviewing regulations that, in their previous jobs, they worked to weaken or eliminate entirely.

We were hoping to ask you some questions ahead of our story publishing. Our deadline is Wednesday, June 21, at noon EST. We hope we will hear from you. If it would be easier to chat by phone please don't hesitate to call. Also, please note that we are requesting this information fully on the record, so that we can fully include your thoughts in the story. If something in particular needs to be on background, we are happy to discuss that with you, but please be advised that, otherwise, our conversations will be on the record.

-Our understanding is that Samantha Dravis, Ryan Jackson, Byron Brown and Brittany Bolen are on your regulatory reform task force. Can you provide us with the names of anyone else assigned to the task force?

-Has the task force identified any regulations yet that might be revised or eliminated? If so, which ones?

-As I mentioned before, we are stating in the story that EPA has thus far refused to disclose the calendar for task force chair Samantha Dravis through FOIA, even as an agency spokeswoman advised us we could get the calendar through FOIA. We also state that Ms. Dravis is a former top official for an industry-funded political group, that she is meeting privately with industry stakeholders, and that the agency is declining to say whether she has discussed regulations to eliminate with any of her previous employers or their funders. We mention Ms. Dravis' post at the the Republican Attorneys General Association, and her tenure as president of its Rule of Law Defense Fund, which brought together energy companies and Republican attorneys general working together to file lawsuits against the federal government over Obama-era environmental regulations. We also mention she worked for Freedom Partners. Will Ms. Dravis' prior employment working for industry-funded groups in any way affect her decision making while at EPA? Outside of agency comment, is there anything Ms. Dravis would like to respond to or add directly?

-Our reporting found that another task force appointee, Byron Brown, is married to Lesley Schaaff, a senior government affairs manager for Hess Corporation who has lobbied the EPA directly. (The company was penalized more than \$45 million by the EPA because of alleged Clean Air Act violations at its refinery in Port Reading, New Jersey.) Has or will Mr. Brown recuse himself from evaluating regulations affecting Hess? Has he received a waiver to work on such issues? Is it a conflict for him to work on such issues? Does he or his wife own any stake in Hess? Schaaff is also a member of the natural gas subcommittee for the American Petroleum Institute, which has lobbied the EPA's regulatory reform task force to ease natural gas rules including on methane emissions. Will Mr. Brown be recusing himself from issues relating to the American Petroleum Institute? Has he received a waiver to work on such issues? Outside of agency comment, would Mr. Brown like to comment on any of these issues directly?

-According to OGE records, none of the task force members have been issued waivers to deal with issues that they recently worked on in the private sector. Have any task force members recused themselves from dealing with any companies or issues and, if so, please elaborate.

-We plan to report that Ryan Jackson was a longtime aide to Sen. Jim Inhofe. How will his prior employment affect his decision making while at EPA? Outside of agency comment, is there anything he would like to respond to or add directly?

-We plan to report that Brittany Bolen was Majority Counsel for the Senate Environment and Public Works Committee (which was chaired by Mr. Inhofe). How will her prior employment affect her decision making while at EPA? Outside of agency comment, is there anything she would like to respond to or add directly?

Thanks,

Robert and Danielle

Robert Faturechi

Reporter, ProPublica

Desk: 917-512-0216

Cell: 213-271-7217

robert.faturechi@propublica.org

To: Jackson, Ryan[jackson.ryan@epa.gov]
Cc: Gunasekara, Mandy[Gunasekara.Mandy@epa.gov]
From: Verma, Puneet (puve)
Sent: Tue 7/11/2017 1:43:10 PM
Subject: FW: Meeting Request: Jeff Shellebarger, Chevron
[JES Pruitt Meeting Request.pdf](#)
[Chevron EPA External Meeting Request Form.docx](#)

Ryan,

In case you have not seen it, I would like to flag the meeting request below/attached for your consideration.

In short, Jeff Shellebarger, President of Chevron North American Exploration and Production Company will be in DC on Wednesday, July 26th and would appreciate the opportunity to meet with Administrator Pruitt if schedules permit. The Administrator met with Jeff previously on March 21st. The focus of this discussion would be to follow up on their conversation about regulatory reform, particularly reforms related to EPA's methane regulations.

Thank you for your consideration.

Regards,

Puneet Verma

Chevron – Federal Government Affairs

600 13th Street, NW, Suite 600

Washington, DC 20005

Office: (202) 408-5807

This message may contain confidential information and is intended only for the use of the parties to whom it is addressed. If you are not an intended recipient, you are hereby notified that any disclosure, copying, distribution or use of any information in this message is strictly prohibited. If you have received this message in error, please notify me immediately at the telephone number indicated below.

From: Rusterholz, Shawn
Sent: Tuesday, June 27, 2017 3:05 PM
To: Morris, Madeline <morris.madeline@epa.gov>
Cc: Verma, Puneet (puve) <PVerma@chevron.com>; Washington, Gregory J (GWashington) <GWashington@chevron.com>; Dickerson, Aaron <dickerson.aaron@epa.gov>
Subject: RE: Meeting Request: Jeff Shellebarger, Chevron

Thank you, Maddy. Attached is the completed scheduling request, as well as our formal request letter. Please let me know if you have any questions or need further information.

Shawn

From: Morris, Madeline [<mailto:morris.madeline@epa.gov>]
Sent: Tuesday, June 27, 2017 11:06 AM
To: Rusterholz, Shawn <SRusterholz@chevron.com>
Cc: Verma, Puneet (puve) <PVerma@chevron.com>; Washington, Gregory J (GWashington) <GWashington@chevron.com>; Dickerson, Aaron <dickerson.aaron@epa.gov>
Subject: [****EXTERNAL****] RE: Meeting Request: Jeff Shellebarger, Chevron

Hi Shawn,

Thanks for reaching out! Do you mind filling out a scheduling request form for the meeting? We are still working on his travel for the end of July schedule. But if we get the form filled out it and least start on the process on our end.

Appreciate your help, and please let me know if you have any questions!

Best,

Maddy

Madeline Morris Executive Scheduler | Office of the Administrator | direct: 202-564-

0844 | cell: 202-579-4283

From: Hale, Michelle

Sent: Tuesday, June 27, 2017 9:57 AM

To: Rusterholz, Shawn <SRusterholz@chevron.com>

Cc: Verma, Puneet (puve) <PVerma@chevron.com>; Washington, Gregory J (GWashington) <GWashington@chevron.com>; Morris, Madeline <morris.madeline@epa.gov>; Dickerson, Aaron <dickerson.aaron@epa.gov>

Subject: Re: Meeting Request: Jeff Shellebarger, Chevron

Good morning! I'm looping in our scheduling team to process your request. Thank you for reaching out.

Sent from my iPhone

On Jun 27, 2017, at 9:49 AM, Rusterholz, Shawn <SRusterholz@chevron.com> wrote:

Good morning Michelle,

I am reaching out on behalf of Jeff Shellebarger, President of Chevron North American Exploration and Production Company. Please see below for my e-mail to Sydney Hupp last night—I received an out-of-office reply asking to contact you. Mr. Shellebarger will be in town on Wednesday, July 26th, and would appreciate the

opportunity to meet with Administrator Pruitt, should his schedule permit.

Thank you,

Shawn

Shawn Rusterholz
Staff Assistant, Federal Government Affairs

srusterholz@chevron.com

Chevron
Policy, Government and Public Affairs
600 13th Street NW, Suite 600
Washington, DC 20005-3027
Tel +1 202 408 5837

Fax +1 202 408 5845

Mobile +1 202 714 2027

From: Rusterholz, Shawn
Sent: Monday, June 26, 2017 6:08 PM
To: Hupp, Sydney <hupp.sydney@epa.gov>
Cc: Greg Washington <GWashington@chevron.com>; Verma, Puneet (puve) <PVerma@chevron.com>
Subject: Meeting Request: Jeff Shellebarger, Chevron

Hi Sydney,

Please see attached for a formal meeting request on behalf of Jeff Shellebarger, President of Chevron North American Exploration and Production Company, to

meet with Administrator Pruitt during his upcoming trip to Washington next month. Mr. Shellebarger will be in town on Wednesday, July 26th and would appreciate the opportunity to sit down with the Administrator, in order to discuss Chevron's operations throughout the United States as well as share our company's perspective on domestic oil and gas developments.

Please let me know if you have any questions. We hope that the Administrator can accommodate this request—thank you in advance for your consideration.

Have a great evening,

Shawn

Shawn Rusterholz

Staff Assistant, Federal Government Affairs

srusterholz@chevron.com

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Mobile +1 202 714 2027

<JES Pruitt Meeting Request.pdf>



Maria Pica Karp

Vice President and General Manager, Government Affairs

June 26, 2017

Transmitted Via Email: hupp.sydney@epa.gov

The Honorable Edward Scott Pruitt
Administrator
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue NW
Washington, DC 20460

Dear Administrator Pruitt:

I am writing to request a meeting for and Jeff Shellebarger, President of Chevron North American Exploration and Production Company, during his upcoming visit to Washington on Wednesday, July 26, 2017. Mr. Shellebarger would like to follow-up on your conversation in March with him and Chevron Chairman and CEO John Watson, to further discuss regulatory reform and Chevron's presence in the United States.

Mr. Shawn Rusterholz will be in contact with your office to schedule a meeting and can be reached at (202) 408-5837 or srusterholz@chevron.com. Thank you in advance for your consideration of this request.

Sincerely,

A handwritten signature in black ink, appearing to read "Maria Pica Karp", with a long horizontal flourish extending to the right.

Chevron Government Affairs

600 13th Street, NW Suite 600, Washington, DC 20005

Tel 202 408 5800 Fax 202 408 5845

mpica@chevron.com



**PRINTING
INDUSTRIES
OF AMERICA**

| *Advancing Graphic Communications*

301 Brush Creek Road | Warrendale, PA 15086-7529
phone: 412-741-6860 | fax: 412-259-2016 | www.printing.org

May 26, 2017

The Honorable Scott Pruitt
Administrator
U.S. Environmental Protection Agency
1200 Pennsylvania Ave, NW
Washington, DC 20460

Dear Administrator Pruitt,

On behalf of the thousands of member companies we represent and the nearly 1 million workers they employ, Printing Industries America (PIA) respectfully requests to meet with you on the afternoon of June 20th, when our Executive Board will be in Washington, DC for its annual policy summit. We would very much appreciate the opportunity to discuss the wide-ranging issues facing our industry and workforce.

PIA thousands of our member companies manufacture products that inform (books, newspapers, magazines, financial and legal printing, etc.), promote (direct mail, retail advertising displays, screen printing, etc.), and deliver (packaging, label and tag printing, etc.). The printing and graphic communications industry's products bolster virtually every sector of the economy.

Today's printers are both manufacturers of printed products using advanced technology and also provide a vast array of services such as web-based technology, data base management, mailing and fulfillment. Generally, the industry is composed of smaller and medium sized firms, although there are a few very large enterprises. More than half of PIA's member companies are family-owned businesses.

The latest data from the Department of Commerce details print's economic footprint: 45,580 facilities (located in every Congressional District and state), 914,591 industry employees, and annual shipments (in millions) of \$155,959. In 2016, among the top 20 verticals supported most by print were: packaged foods, medical/pharmaceutical, real estate, telecommunications, automotive and travel and hospitality industries.

Policy issues of interest to the printing industry include: labor/employee benefits (including promotion of technical and vocational education), postal reform, paper advocacy, regulatory relief (particularly regarding Department of Labor, EPA, and OSHA), and tax policy. Of particular importance is the modernization and future viability of the US Postal Service. Over half of printed products end up in the mailstream, making USPS a critical delivery channel and supply chain partner. Additionally, public policy attempts to restrict or tax advertising are highly concerning to PIA.

Below is a more-detailed briefing of the issues our Executive Board would like to present to the Secretary and Department at our proposed June 20th meeting:

Regulatory Reform

Although great strides have been made to reduce the environmental footprint of the printing industry, it remains a heavily regulated industry with nearly every aspect of the production process subject to permits and regulations. Air emissions are addressed by several regulations. Other regulations include controls for waste water discharges, water reclamation; storm water discharges, “oil” storage and emergency response; solvent cleaning; ozone depleting substances, and proper handling of waste materials used in the production process such as inks, solvents, light bulbs, and contaminated shop towels. On March 31, 2017, PIA (as part of the Graphic Arts Coalition) submitted detailed comments and suggested action steps regarding these issues. A copy of a letter highlighting these comments is attached.

Sustainability

Sustainable manufacturing for the printing industry embodies three principal concepts:

- Product – The design, the input materials used to make it, and the ultimate fate of the finished goods;
- Process – The actual manufacturing process involving prepress, press and postpress; and
- Envelope – The support activities that occur at a printing operation such as the building, grounds, maintenance, transportation, employees and the like.

PIA is proud to offer the Sustainable Green Partnership (SGP), an industry-specific, voluntary program designed to reduce the environmental impact and increase social responsibility of the print and graphic communications industry. The Partnership certifies printers against specific criteria and requires printers to commit to making continuous improvement in the product, process, and envelope areas of the graphic arts industry.

Once again, we would appreciate the opportunity to present these issues in more detail at our meeting on June 20th. We thank you in advance for considering this request and look forward to your timely response.

Sincerely,

Michael Makin
President & CEO
Printing Industry Association

To: AO OPA OMR CLIPS[AO_OPA_OMR_CLIPS@epa.gov]; McMichael, Nate[McMichael.Nate@epa.gov]; Greaves, Holly[greaves.holly@epa.gov]; Bloom, David[Bloom.David@epa.gov]; Williams, Maria[Williams.Maria@epa.gov]; Terris, Carol[Terris.Carol@epa.gov]; Walsh, Ed[Walsh.Ed@epa.gov]
From: So, Katherine
Sent: Tue 5/30/2017 2:01:24 PM
Subject: InsideEPA: Budget cuts seen limiting EPA's ability to implement deregulatory push, 5/30/17

InsideEPA

<https://insideepa.com/daily-news/budget-cuts-seen-limiting-epas-ability-implement-deregulatory-push>

Budget cuts seen limiting EPA's ability to implement deregulatory push

By Abby Smith 5/26/17

The White House plan to drastically cut EPA's budget and workforce could, if enacted, undermine its ability to comply with President Donald Trump's deregulatory orders, observers say, complicating what could already be a difficult feat for an agency that faces many statutory and legal obligations to regulate.

“The question I would have for them is: Have they really thought about the resources that will be needed to do the kind of regulatory review they're asking for?” one industry attorney tells *Inside EPA*. The source notes that “undoing a rule takes just as much effort as doing a rule, in most cases.”

The Trump administration's fiscal year 2018 budget plan, [released May 23](#), proposes a 31 percent cut to EPA's budget, slashing agency spending to \$5.655 billion -- a \$2.6 billion cut -- and seeking to reduce agency workforce by 25 percent to 11,611 full-time equivalent staffers.

The attorney and others say scaling back resources to those levels may make it difficult to proceed with the notice-and-comment rulemaking process in order to roll back or pare down existing Obama-era climate and environmental regulations.

Trump has signed a series of executive orders (EO) driving his administration's deregulatory

agenda, including EO 13783, the energy independence order; EO 13777, which calls for agencies to establish regulatory reform task forces to review existing rules to “repeal, replace or modify”; and EO 13771, better known as the “two-for-one” order that requires agencies to repeal two existing rules for every one new rule and meet a \$0 net regulatory cost target.

Some, like the energy independence order, identified specific rules for repeal, including EPA's power plant greenhouse gas rules and its rule regulating methane emissions from new oil and gas sources. A separate EO targeted the Clean Water Act (CWA) jurisdiction rule. EPA has already initiated reviews of these rules.

But the orders also cast a broader net. For example, the March 28 energy independence order outlines a process by which agencies must review existing rules to determine those that potentially burden domestic energy production and appropriately revise or rescind those that “unduly” burden it.

And EPA just ended a comment process to comply with EO 13777 where it sought recommendations from industry and others to identify “burdensome” existing rules for “repeal, replacement or modification,” a process that resulted in scores of rules being nominated for consideration.

The industry attorney says the “question that people aren't really thinking about” is whether the administration can accomplish both goals: to “reduce the burden of unnecessary regulation and dramatically cut EPA's budget.”

The Trump EPA budget plan does specifically include “resources to support the review of the Clean Power Plan,” EPA's GHG standards for existing power plants, though it is unclear the exact level of funding and staff that would be dedicated to this task. The proposal also mentions the agency's ongoing review of the CWA jurisdiction rule, though it does not specify whether resources have been singled out to support that review.

EPA, along with the Army Corps of Engineers, “are implementing” Trump's EO to review the CWA jurisdiction rule “and publish for notice and comment a proposed rule rescinding or revising the rule, as appropriate and consistent with law.”

Additional Funds

The budget request does provide some additional funds to help implement the administration's deregulatory agenda, proposing a \$662,000 boost for the Regulatory/Economic, Management and Analysis Program.

According to EPA's budget justification, the increase would help the program oversee implementation of Trump's deregulatory orders, update agency guidelines for assessing rules' cost and benefits, develop “improved” analytical tools to advance EPA's risk assessment methods used in quantifying human health benefits and other functions.

The boost would bring funds for the program from \$14.6 million in FY17 to \$15.2 million in FY18.

But it is unclear whether the increase in funds for that program would be sufficient to undertake the kind of broad regulatory review and reform Trump outlines for the agency in the deregulatory executive orders.

Despite the modest increase in funds to the regulatory/economic program, the Trump budget proposal includes steep cuts to agency program offices, such as a 47 percent cut from EPA's clean air office and a more than 90 percent cut from the air and radiation office under the environmental programs and management account.

The industry attorney does not have a sense of how involved EPA officials have been in the budget process, but the source is not aware of “any kind of analysis of the resources they would need” to comply with Trump's regulatory reform orders. The source would hope EPA would work with the White House Office of Information and Regulatory Affairs (OIRA) “to figure out the resources it needs to carry out regulatory reform.”

But the attorney adds: “I don't think they've sat down and done that analysis.”

The industry attorney says much of the work EPA does for its various review processes will overlap and ultimately point to the same list of regulations to be repealed or revised. But the source also warns that the processes themselves -- each of which require extensive review and the submission of various plans to the White House -- could hamper the ability of EPA and other agencies to actually carry out the regulatory reforms.

The source compares the predicament to crafting a “to do” list, explaining that taking the time to ensure everything is on the list subtracts from the time one can spend completing the tasks.

The attorney says EPA needs to begin to determine how they will repeal or revise the rules under review. “Ultimately what EPA needs to do is the hard work: developing a proposed rule in a thoughtful way, reviewing the comments, finalizing that rule and doing all that in a way that will stand up in court,” the source says. “Too much time spent on these high-profile public relations efforts is time taken away from the regulatory efforts that ultimately” are going to change the rules.

The industry source also suggests it will be difficult for the Trump administration to make progress on regulatory reform until there are more political appointees at EPA. Thus far, Susan Bodine is the only person to be nominated to fill a sub-cabinet position, as head of EPA's enforcement office. “It really is the assistant administrators and the deputy administrator that really run the regulatory process,” the attorney says, noting that for the review of regulations like the Clean Power Plan or the CWA jurisdiction rule “hundreds of decisions” will have to be made. “If you have to go to the administrator” for each of those decisions “you're not going to get much done.”

In addition, the industry attorney suggests that due to the relatively broad scope of the regulatory review outlined by the Trump administration, EPA officials will need to have some type of “criteria” by which to conduct the process.

'Toughest Time'

Beyond those regulations spelled out in Trump's energy order, Sam Batkins, director of regulatory policy at the American Action Forum (AAF), says actions where EPA has delayed the effective date of existing rules offer signs those regulations are likely to be a focus of regulatory review.

Some such examples include: rules regulating methane emissions from new and existing landfills; the power plant effluent rule; the pesticide applicators rule; and the Risk Management Plan rule.

Batkins and others also say EPA could have an especially difficult time complying with some of the directives in Trump's deregulatory orders, in part because the agency faces statutory and legal requirements to promulgate regulations.

Because of this, he says EPA could have the “toughest time” implementing the two-for-one order in particular. He notes that according to separate analysis by both AAF and OIRA, EPA is typically “the most active regulator in terms of cost,” with \$2 billion-\$3 billion in regulatory costs per year. And under the two-for-one order, the agency would have to find that much in offsets.

Batkins says AAF has “never found a time when EPA found \$2 billion” in regulatory offsets, meaning to meet the two-for-one order requirements, the agency is “really going to have to string together many of these regulatory offsets.” And he notes that the agency's statutory mandates “aren't going to change,” and thus it will face several requirements under the Clean Air Act in terms of national ambient air quality standards and under the updated Toxic Substances Control Act, among others, to promulgate new regulations.

Since 2005, AAF has found 49 instances where EPA reduced regulatory costs, leading to \$1.3 billion in fewer annual burdens. “So it's not like Republican and Democratic administrations haven't reduced costs at EPA,” Batkins says, though noting “the scale will be different this time.”

Perhaps making EPA's task more difficult, Batkins adds, is that no EPA rules were repealed by Congress using the Congressional Review Act (CRA), even though lawmakers passed 14 resolutions scrapping various regulations from other agencies. The agencies that did see rules scrapped by the CRA, including the Department of Interior, Department of Education and others,

are not “prolific regulators historically,” Batkins explains, noting that those agencies will be able to use CRA credits to offset future regulatory costs under the two-for-one order, while EPA could struggle.

Batkins suggests there were some EPA rules eligible for the CRA process, such as the phase two GHG standards for heavy-duty trucks and the aircraft endangerment finding. But he says politics was likely a driver for why those were not introduced, citing [the Senate's failed attempt](#) to pass a resolution scrapping a Bureau of Land Management rule curbing methane leaks from oil and gas sources on federal lands.

Nonetheless, Batkins says it is “not impossible” for EPA to meet its “two-for-one” order goal, especially if it were able to trade with other agencies for credits. That trading program, however, must be approved by the Office of Management & Budget. -- *Abby Smith*
(asmith@iwpnews.com)

Katherine So

Office of Media Relations Intern

U.S. Environmental Protection Agency

Telephone: (202)-564-4511

so.katherine@epa.gov

To: AO OPA OMR CLIPS[AO_OPA_OMR_CLIPS@epa.gov]
From: McGonagle, Kevin
Sent: Fri 6/16/2017 1:25:32 PM
Subject: Politico: Unpacking Pruitt's early days as administrator, 6/16/17

Politico

<https://www.politicopro.com/tipsheets/morning-energy/2017/06/zinke-appears-cool-to-fully-rescinding-national-monuments-023335>

Unpacking Pruitt's early days as administrator

By Anthony Adragna 6/16/17

PRUITT'S EARLY SCHEDULES RELEASED: After months of requesting them, EPA released Administrator Scott Pruitt's schedules for his first five weeks in office to E&E News late Thursday. They show a host of previously-known meetings with governors and industry figures, but also detail undisclosed private meetings with senior energy industry VIPs — and virtually no interactions with environmentalists.

Wading into the White House: Before he helped convince President Donald Trump to ditch the Paris climate deal, Pruitt lunched separately with members of the dueling ideological camps inside the White House. On March 13, Pruitt sat down with the president's daughter Ivanka Trump, who ultimately failed to convince her father to stick with the accord. A few days later, he discussed climate change with Stephen Miller, one of the president's more populist conservative advisers.

Congress calls: Sen. Todd Young (R-Ind.) scored an early win when a when a March 8 call to raise the USS Lead Superfund site in East Chicago led to a personal visit by Pruitt on April 19. Indiana's other senator, Democrat Joe Donnelly, also scored a phone call with Pruitt. And Pruitt met once with Sen. Luther Strange (R-Ala.), a longtime collaborator on environmental lawsuits when both were AGs. The topic, according to Pruitt's schedule, was the "Alabama sweep," which ME is guessing is a sports thing.

Industry invites: Pruitt spoke at a dinner gathering of the American Petroleum Institute's executive committee and board of directors — held at the Trump Hotel, across the street from EPA headquarters. Pruitt also discussed regulatory reform and "Chevron's perspective on global oil and gas developments" with Chevron chief John Watson. Steve Pastor, a petroleum executive

with BHP Billiton, asked for a meeting to “thank [Pruitt] for leadership.”

More industry meetings with: Coal CEO Bob Murray; Andrew Liveris, Dow Chemical; Lynn Good, Duke Energy; Sean Trauschke, Paul Renfrow and George Baker of OGE Energy; National Rural Electric Cooperative Association CEO Jim Matheson; BMW Global Chairman CEO Harald Krüger; A.J. Ferate, vice president of regulatory affairs at Oklahoma Independent Petroleum Association.

Odds and ends: Pruitt on several occasions blocked out time for CIA Director Mike Pompeo, but no other details were included. At Pruitt's request, former Virginia attorney general Ken Cuccinelli stopped by to talk about an undisclosed topic. Cuccinelli is now general counsel for FreedomWorks, the Koch-connected group. Pruitt met in his office on March 22 with Kevin Hern, a Tulsa businessman planning to run for the seat of Rep. Jim Bridenstine, who said he would limit himself to three terms. Pruitt also met with: German Environment State Secretary Jochen Flasbarth; Environmental Council of the States executive director Alexandra Dunn; Jason Grumet of the Bipartisan Policy Council; James T. Conway and others from Securing America's Future Energy; San Joaquin Valley Air Pollution Control District executive director Seyed Sadredin.

An ear for ethanol: Pruitt's calendar is light on details in terms of what was discussed, with a few exceptions. On several occasions Pruitt discussed the federal biofuels mandate, including a wonky dispute over which companies are responsible for complying with the law. Pruitt has the final call on a petition the Obama administration proposed rejecting that would move the so-called point of obligation from oil refiners to fuel blenders. The point of obligation was a topic of discussion when Pruitt met with Greg Love of Love's Travel Stops, which belongs to a trade association representing truck stop owners that has come out against shifting the obligation. Pruitt also discussed the topic with George Damiris, the CEO of HollyFrontier, an independent refiner that supports the shift. And he discussed the Renewable Fuel Standard with BP America CEO John Minge, whose company is part of a coalition pushing to keep the point of obligation where it is. Pruitt also met separately with National Corn Growers Association CEO Chris Novak and Corn Refiners Association CEO John Bode alongside other agriculture industry representatives, although his calendar did not list the topics they discussed.

Did we miss anyone?: No meetings with environmentalists were listed on Pruitt's calendar, which covered Feb. 21 to March 31. Pruitt's first public meeting with greens was a few weeks later, when he met with members of the Nature Conservancy and Audubon Society.

Meanwhile, more Oklahoma emails: More than 4,000 of newly-released emails from Pruitt's

time as Oklahoma attorney general provide further evidence of how closely he coordinated with fossil fuel companies, The Associated Press [reports](#). The records, which contain schedules and lists of speaking engagements, detail dozens of meetings between Pruitt, members of his staff, and executives and lobbyists from the coal, oil and gas industries.

EPA FIGHTS TO KEEP METHANE STAY: EPA asked a federal appeals court to reject environmentalists' request to reinstate key parts of the agency's rule limiting methane emissions from new oil and gas wells. As Pro's Alex Guillén [notes](#), the agency further increased tension this week by [proposing](#) a two-year delay of those requirements. "There is no emergency," and the environmental groups cannot meet the requirements to obtain court action, EPA argued in a Thursday [court filing](#). Those green groups must respond by June 20 and look for court action to follow shortly afterwards.

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To: Jackson, Ryan[jackson.ryan@epa.gov]
From: Coyner, Emily W.
Sent: Thur 7/6/2017 5:21:56 PM
Subject: Speak to NSSGA on September 25 or 26?

Ryan,

Thanks again for meeting with us on May 23 with Administrator Pruitt. We appreciate the effort that you at EPA are putting into fixing the Waters of the U.S. rule and general regulatory reform.

We are having a meeting here in Washington at the Hyatt Regency and wondered if you would be available to speak on September 25 or 26. We have several sessions open and could work around your busy schedule. Our members would really enjoy an update on regulatory reform activities at EPA. Please let me know if you have availability.

Emily W. Coyner, P.G.

Director, Environmental Policy

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To: AO OPA OMR CLIPS[AO_OPA_OMR_CLIPS@epa.gov]
From: So, Katherine
Sent: Mon 6/5/2017 2:00:42 PM
Subject: InsideEPA: White House seen backing push to overhaul 'In-The-Weeds' EPA policies, 6/5/17

InsideEPA

<https://insideepa.com/daily-news/white-house-seen-backing-push-overhaul-weeds-epa-policies>

White House seen backing push to overhaul 'In-The-Weeds' EPA policies

By Amanda Palleschi 6/5/17

The White House appears to be supporting states' calls to overhaul smaller “in-the-weeds” EPA rules such as ending a policy permanently subjecting units to air toxics limits and easing paperwork mandates, seeing backing for targeting these less-prominent rules in lieu of calls to undo “big ticket” Obama-era policies, an industry source says.

While much attention on comments in response to President Donald Trump's deregulatory executive orders (EO) has focused on challenges to landmark rules such as the Clean Power Plan greenhouse gas standards for power plants and Clean Water Act jurisdiction rule, the source suggests lesser-known rules could be more viable targets for the regulatory reform push -- particularly a slew of administrative and other regulations that states have identified.

The industry source says that stakeholders who heard from administration officials were surprised they were interested in hearing state and local concerns beyond “some of the high profile/big ticket items” and “wanted to hear from co-regulators on more technical, in-the-weeds examples of burdensome regulations.”

EPA Administrator Scott Pruitt established a regulatory reform task force to assess potential regulations that could be subject to Trump's EO 13777, which calls for agencies to establish regulatory reform task forces to review existing rules to “repeal, replace or modify”; and EO 13771, better known as the “two-for-one” order that requires agencies to repeal two existing rules for every one new rule and meet a \$0 net regulatory cost target.

The agency's air, water, toxics and other divisions held a series of meetings to seek input on rules that could be subject to the regulatory reform effort, and also took written comment through May 15.

In comments, groups such as the Environmental Council of States (ECOS) -- representing many state environmental agencies -- identified rules and policies across the spectrum of EPA authority for overhaul and, in most cases, eliminating entirely, due to overlapping state requirements.

ECOS and others, in their comments, addressed a wide range of major rules and less-prominent policies, including the Clean Water Act (CWA)'s sewage overflow requirements, National Pollution Discharge Elimination System permits and the CWA jurisdiction rule, to the Clean Air Act's "Once in, Always in" air toxics policy and its maintenance area monitoring requirements, to a host of Superfund rules and regulations.

The industry source says Pruitt and his task force "were very interested in hearing from state, local, and tribal agencies on their priorities for regulatory reform," and said some of the interest was likely due to Pruitt's "interest in animating cooperative federalism," which he has called a priority during his tenure.

Cooperative federalism in this context refers to the balance between EPA and state authority over environmental regulation, and Pruitt has said he wants to return more of that power to states.

'In-The-Weeds' Rules

The administration might now look to the "in-the-weeds" rules identified by states as a priority under the reform push, the industry source says. "We have heard directly from the Regulatory Reform Task Force and the White House on their interest in hearing/addressing some of the key regulations identified by state, local, and tribal governments, so we are hopeful that some of the weedier suggestions may be considered," the source says.

The source says states and industry groups concur with the administration that addressing environmental rules through EO 13777 is a "key opportunity to weigh in at the intersection of several interagency processes," particularly after the Department of Commerce received what the

source called “relatively limited responses” to its request for comments on the impact of federal permitting requirements on domestic manufacturing.

The “technical regulatory actions” that the source says states identified and would likely be “welcome suggestions” to the administrative officials -- and more easily addressed under the EO -- include the Clean Air Act's “Once In, Always In” policy as well as general “paperwork, reporting or permitting requirements.”

The “Once In, Always In” policy currently requires sources subject to maximum achievable control technology (MACT) thresholds to always be subject to the same MACT standard, regardless of whether they reduce their emissions of hazardous air pollutants (HAPs). States say this policy fails to encourage additional air toxics reductions if facilities know they can never avoid MACT regulation even if they cut their emissions.

The Northeast States for Coordinated Air Use Management, for example, said in comments that reconsidering this policy would “reduce administrative and reporting burdens,” but says it must be “contingent upon the pollution prevention measures being permanent and enforceable through permit conditions.”

The Association of Air Pollution Control Agencies echoed this request, arguing that the current policy “can unfairly limit the abilities of subject sources to make modifications or operate in a competitive market.”

As part of the regulatory reform push, the industry source says the administration also welcomes technical suggestions that target repeal of “paperwork, reporting and permitting” requirements.

ECOS in its comments mentioned requirements, such as the Superfund program's cooperative Agreements for Superfund Response Actions in state contracts, arguing in part that state staffs already do much of the work on these grants and agreements, and detailed reports are “burdensome.”

The Western Governors' Association, in addition to recommendations to “clarify key enabling

statutes” -- CWA, the Clean Air Act, the Resource Conservation and Recovery Act (RCRA) and Superfund -- asked in its comments that EPA “recognize states' exclusive authority” over a variety of permitting programs, such as state water quality standards and setting Total Maximum Daily Loads (TMDLs), avoiding duplication of state programs, and publish “timely guidance” for states, particularly in implementing the stricter 2015 ozone ambient air standard.

States' Suggestions

Other state environmental agencies, such as South Carolina and Ohio, asked EPA to reexamine its Title V operating permit program for emissions. The Ohio EPA, in its comments, pointed out that EPA has yet to respond to a 2006 task force report in which stakeholders gave input on the program and identified “much-needed improvement” to the permit system. Both states also asked EPA to examine how it expects states to “demonstrate compliance” with its Cross-State Air Pollution Rule (CSAPR) emissions trading program standards for nitrogen oxides.

“It is an unreasonable burden and complete waste of resources to continue to demonstrate compliance with requirements that no longer have a real impact on air quality, as they have been effectively superseded by more stringent rules,” the Ohio EPA writes in its May 15 comments. -- *Amanda Palleschi* (apalleschi@iwpnews.com)

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To: AO OPA OMR CLIPS[AO_OPA_OMR_CLIPS@epa.gov]
From: McGonagle, Kevin
Sent: Fri 5/26/2017 5:32:23 PM
Subject: E&E News: EPA moves to delay power plant dumping rule compliance, 5/26/17

E&E News

<https://www.eenews.net/greenwire/2017/05/26/stories/1060055228>

EPA moves to delay power plant dumping rule compliance

By Sam Mintz 5/26/17

U.S. EPA yesterday said it wanted to postpone compliance dates for an Obama administration regulation related to polluted water releases from power plants.

A proposal signed by EPA Administrator Scott Pruitt calls for a 30-day public comment period on a plan to push back compliance dates for part of the rule, which requires companies to use the "best available technology economically achievable" for a variety of waste streams.

"This proposed rule is one of nearly two dozen significant regulatory reform actions I have taken during my short time as EPA Administrator to protect the environment, jobs and affordable, reliable energy," said Pruitt in a statement.

If finalized, he said, the action "will provide relief from the deadlines under the existing ... Rule while we carefully consider the next steps for this regulation."

EPA's decision comes after industry groups petitioned the agency to reconsider the rule, saying the wastewater guidelines were "inconsistent" with President Trump's agenda of regulatory reform (Greenwire, March 28).

On its website, EPA said that it was moving to push back "impending deadlines" as a "temporary, stopgap measure" while it reviews the regulation.

The rule, finalized in September 2015, amounts to the first federal guidelines for toxics and pollutants in power plant discharges in more than 30 years. They focus on dissolved pollutants like mercury, lead, selenium and other heavy metals.

Environmental groups criticized EPA's latest move. "The mere fact that EPA is now seeking comment on the illegal stay doesn't make it any less illegal," said Earthjustice attorney Thomas Cmar.

Activists sued EPA earlier this month after the agency announced it would halt the regulation (Greenwire, May 3).

"Scott Pruitt lacks the authority to arbitrarily roll back public health protections with the stroke of a pen," Cmar said.

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To: Jackson, Ryan[jackson.ryan@epa.gov]
Cc: Angie Cooper - Global Public Policy[Angie.Cooper@walmart.com]
From: Bruce Harris
Sent: Wed 6/28/2017 10:15:03 PM
Subject: Thanks and Follow-Up
[Walmart Global Responsibility.docx](#)
[Project Gigaton - overview.pptx](#)
[EO 13777 Walmart Comments May 15 2017.pdf](#)

Ryan –

Thanks again for taking the time to meet with Angie and me last week. It was nice to meet you and we look forward to a continued dialogue.

As we discussed, I have provided below and attached additional materials regarding Walmart's Environmental and Sustainability Goals. I have also included the information regarding comments we recently submitted to an Executive Order Request. We are happy to answer any additional questions or connect with others within the agency if needed.

Again, thank you for your time. We look forward to being in touch.

Bruce

Additional Materials

Walmart Global Responsibility

- Sustainability Goals (attached)
- Recently launched Project Gigaton (attached)

Walmart Comments to Executive Order Request - Enforcing the Regulatory Reform Agenda

**full comments attached*

- RCRA was developed to manage industrial waste and was not intended to impact the disposal of products used in the home. Requiring retailers to handle items like shampoo as hazardous waste is inefficient and increases the costs for these items and others sold by retailers. We would recommend the following changes:

- o Amend 40 CFR 261.4(b)(1) to include Consumer Products as Household Waste regardless of the location of their generation

- o Expand Universal Waste Rules to Cover Consumer Products

- o Protect the Legitimate Business Process of Reverse Distribution

- o Issue a Clarification around Recycling of Aerosol Cans

- o Exempt Low Concentration Nicotine Products from RCRA Regulation

- o Repeal the Final Rule on Hazardous Waste Generator Improvements

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May 15, 2017

U.S. Environmental Protection Agency
EPA Docket Center
EPA-HQ-OA-2017-0190

**Re: EPA Docket No. EPA-HQ-OA-2017-0190
Executive Order 13777, Enforcing the Regulatory Reform Agenda, Request for
Comment
82 Fed. Reg. 17,793 (April 13, 2017)**

Walmart is pleased to provide the attached comments to the U.S. Environmental Protection Agency (EPA) on Executive Order 13777, Enforcing the Regulatory Reform Agenda, Request for Comment which was published in the Federal Register on April 13, 2017. See 82 Fed. Reg. 17,793.

Should EPA have questions about the comments or any technical difficulties, please contact either of the undersigned below. Walmart truly appreciates EPA granting it the opportunity to submit these comments. By working together in an open and cooperative manner, Walmart believes it is possible to design and implement regulations that are protective of human health and the environment and make sound business sense.

Sincerely,


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Enclosure



Walmart Comments to Executive Order Request

Enforcing the Regulatory Reform Agenda

Docket ID No.: EPA-HQ-OA-2017-0190

82 Fed. Reg. 17,793 (April 13, 2017)

Walmart Stores, Inc. ("Walmart") thanks the U.S. Environmental Protection Agency ("EPA") for the opportunity to provide comments on Executive Order 13777 (herein, the "Executive Order" or "EO") entitled "Enforcing the Regulatory Reform Agenda." While there are many potential topics of concern Walmart could discuss, in order to direct EPA's attention to our most pressing issues, Walmart has chosen to focus our comments on two aspects of how EPA regulations significantly negatively impact our business¹. Walmart would be glad to assist EPA by providing further information regarding these two areas, or to discuss any other areas of environmental regulation if requested by EPA.

In addition to filing these comments, Walmart also fully supports the comments to this Executive Order submitted by both the Retail Industry Leaders Association (RILA) and the National Association of Chain Drug Stores (NACDS).

Executive Summary

Hazardous Waste

Perhaps more than any other retail business, Walmart has been required to wrestle with the Resource Conservation and Recovery Act's (RCRA's) regulation of common consumer products. The significant burden placed on the retail sector by RCRA far outweighs the environmental benefits, and ultimately, results in increased prices for American consumers. To that end and as explained in more detail below, Walmart suggests the following revisions to RCRA:

- Amend 40 CFR 261.4(b)(1) to include Consumer Products as Household Waste regardless of the location of their generation
- Expand Universal Waste Rules to Cover Consumer Products
- Protect the Legitimate Business Process of Reverse Distribution
- Issue a Clarification around Recycling of Aerosol Cans
- Exempt Low Concentration Nicotine Products from RCRA Regulation
- Repeal the Final Rule on Hazardous Waste Generator Improvements

¹ As an example of other issues, Walmart is also concerned about the Local Emergency Planning Committee (LEPC) requirements under the changes to the 40 CFR Part 68 (Risk Management Plan) as not all communities have active LEPCs and would appreciate the opportunity to discuss this issue further with EPA.

Refrigeration

Walmart also has significant concerns regarding the regulatory burden associated with new commercial refrigeration regulations. Walmart thanks EPA for this opportunity to inform the Agency of the some of the more onerous changes to the Significant New Alternatives Policy (“SNAP”) program promulgated under the Clean Air Act (“CAA”)^{2,3} affecting its business, and predominantly its store remodel program, over the next several years. Specifically, Walmart suggests the following revisions:

- Allow supermarkets the flexibility to make the kind of minor expansions of existing systems that are typical during a remodel, such as adding a produce or cheese island, utilizing existing refrigerants, as long as the minor changes don't significantly alter the intent or capacity of the system until other options are available.
- Revise the refrigerant management requirements so that systems that have undergone previous repairs to all leaks would not be subject to annual or quarterly leak inspections.

Introduction

Walmart strives to be an environmental leader and believes everyone benefits when we work with regulators to develop policies and regulations that achieve environmentally protective results and make sound business sense. Walmart is committed to environmentally sustainable business practices and has been recognized as one of the world's leading companies in the sustainability arena.⁴

Domestically, Walmart operates more than 5,000 retail stores, employs over 1.4 million associates, and serves over 140 million customers every week. Walmart retail stores are comprised of a mix of grocery, general merchandise, pharmacy, and membership-oriented stores. Walmart is privileged to do business in the United States and understands that compliance with environmental laws is a pre-requisite to the success and sustainability of our business.

1. Hazardous Waste - Consumer Products, RCRA and the Retail Sector

The retail sector of the American economy has struggled when RCRA hazardous waste regulations, crafted with complex industrial plants in mind, are applied to neighborhood department stores, supermarkets, pharmacies or convenience stores. Walmart has expended considerable effort to meet

² See: “Protection of Stratospheric Ozone: Change of Listing Status for Certain Substitutes Under the Significant New Alternatives Policy Program”; Final Rule; 40 CFR Part 82 Vol. 80, No. 138 (July 20, 2015).

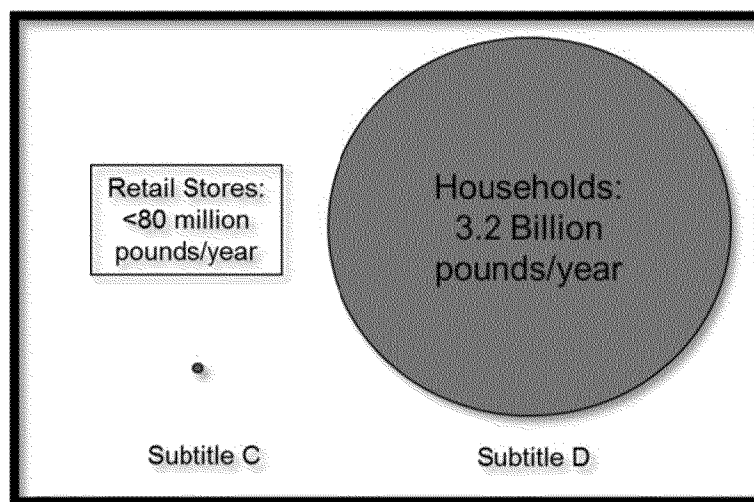
³ See: “Protection of Stratospheric Ozone: Update to the Refrigerant Management Requirements under the Clean Air Act”; Final Rule; 40 CFR Part 82 Vol. 80, No. 223 (November 16, 2016).

⁴ Walmart has three aspirational sustainability goals: 1) Create Zero Waste; 2) Be Powered by 100% Renewable Energy; and 3) Sell Products that Sustain People and the Environment. For information on Walmart's sustainability initiatives, accomplishments, and commitments, please visit walmartsustainabilityhub.com.

the requirements of RCRA and can attest that the intersection of consumer retail and RCRA is most aptly described as the proverbial “square peg in a round hole.”

As EPA recognized in the recent retail Notice of Data Availability (Docket ID No. EPA-HQ-RCRA-2012-0426) (“NODA”) (February 14, 2014) and resulting Strategy for Addressing the Retail Sector under RCRA’s Regulatory Framework (September 12, 2016), significant challenges exist for the Retail Sector regarding the RCRA’s application to consumer products.⁵ Walmart commends EPA for its efforts to begin addressing the unique retail issues since RCRA regulations were not designed with retail businesses and consumer products in mind.

This is particularly true for “consumable” consumer products, which are those products sold to the general public for consumption in or on the body.⁶ In fact, EPA has already exempted the vast majority of consumer products from management under RCRA Subtitle C through its development of the household hazardous waste exclusion in 40 CFR 261.4(b)(1). As a result of RCRA’s household waste exclusion, tens of billions of pounds of consumer product waste, including several billion pounds of RCRA hazardous wastes, are safely managed under the Subtitle D solid waste program. In contrast, Walmart has estimated that the entire Retail Sector disposes of less than 80 million pounds of RCRA hazardous consumer products per year, much of which is also managed pursuant to Subtitle D because it is generated by conditionally exempt retail businesses or by businesses that simply have no understanding of RCRA and/or make no attempt to comply with RCRA as it relates to consumer products.⁷ Hence, only a very small percentage of discarded consumer products are generated by retail businesses that are subject to and comply with Subtitle C as RCRA Small or Large Quantity Generators (SQGs and LQGs).



Depicted are estimates for the different destinations of Consumer Product RCRA Hazardous Waste.

⁵ See EPA’s Retail NODA dated February 14, 2014 and Walmart’s comments as part of the NODA official record.

⁶ The Wall Street Journal had it correct in the Article on January 18, 2011, titled “Toward a 21st- Century Regulatory System” - “[I]f it goes in your coffee, it is not hazardous waste”

⁷ For a description of the calculations and assumptions used in the estimate, see page 6 of Walmart’s NODA response.

Therefore, the present application of RCRA results in an off-kilter regulatory scheme where approximately 99% of discarded hazardous consumer products by weight are managed under Subtitle D while less than 1% by weight are subject to full Subtitle C RCRA regulation. If hazardous consumer products are truly an environmental threat requiring Subtitle C regulation, then the current regulatory scheme is clearly backwards. Fortunately, consumer products and, particularly consumable consumer products, are not an environmental threat when managed under Subtitle D. Literally billions of consumer products have been managed under the Subtitle D program for decades, and continue to be managed, without issue.⁸

As EPA recognized through the Retail NODA process, reform of RCRA's application to the Retail Sector and consumer products is necessary and should be a top priority in the near term. Applying full Subtitle C regulation to only 1% of the discarded consumer products does not produce any tangible environmental or human health benefits but does come at a significant economic cost. This places an undue regulatory burden on a sector of the economy ill-equipped to handle it. For the reasons discussed in the Retail Sector's responses to the Retail NODA, retail stores face extraordinary hurdles attempting to comply with RCRA, including large numbers of locations and the requirement to evaluate millions of unique consumer products against RCRA's complex waste characterization scheme.⁹

The Retail Associations estimated in their comments to the Proposed Generator Improvements Rule, retail stores represent over a quarter of the registered LQGs in the country based on 2013 biennial reporting data. This is primarily because of discarded smoking cessation products that contain nicotine, such as nicotine gum. Presumably, no one at EPA had retail stores in mind when developing the hazardous waste management rules for LQGs. To the contrary, EPA likely contemplated that facilities generating little hazardous waste would be categorized as Conditionally Exempt Small Quantity Generators (CESQG), such as retail stores producing the same type of waste as households. With over 5,000 retail stores currently registered as LQGs, the seemingly common sense generator status framework under RCRA has been upended with retailers representing the single largest group of highly regulated hazardous waste generators.¹⁰

While the economic impacts and operational difficulties imposed by RCRA on the Retail Sector are an undue regulatory burden, enforcement has now aggressively followed RCRA's application to retail and consumer products. Environmental enforcement offices at both the federal and state level find easy targets in businesses that literally had no understanding of how EPA and states would apply RCRA to long-standing retail business practices. Many of the largest RCRA fines in the last five years are

⁸ Modern Subtitle D landfills are well engineered facilities that are located, designed, operated, and monitored to ensure compliance with federal regulations. Applicable federal landfill standards include: location restrictions, composite liner requirements, leachate collection and removal systems, operating practices requirements, groundwater monitoring requirements, closure and post-closure care requirements, corrective action provisions, and financial assurances. (see EPA website: <https://www.epa.gov/landfills/municipal-solid-waste-landfills#whatis>)

⁹ Retailers also need to deal with high employee turnover, manage the public interaction within these facilities, train employees to handle the same products they safely use at home every day as hazardous waste, and deal with ingredients that are trade secrets, to name a few of the additional challenges.

¹⁰ As noted in the Retail Associations' comments to the Proposed Generator Improvements Rule, December 23, 2015, page 10, retailers are the single largest group of hazardous waste generators, and may well represent over half of the affected entities (although the amount of hazardous wastes they generate represents an almost negligible percentage of the total hazardous waste generation in the country).

against retail business and involve consumer products. In particular, many of these cases involve reverse distribution, a standard part of all retail operations. Reverse distribution essentially involves the withdrawal and consolidation of consumer products that are not sold in retail stores. Reverse distribution processes were developed long before RCRA, and far from being an attempt to avoid RCRA, reverse distribution is a legitimate, multi-billion dollar industry that is good for the environment and the public. Standing alone, Walmart's own reverse distribution operations would be a Fortune 500 company.¹¹

Reverse distribution facilitates the inventory process for credit, accounting, and recall confirmation along with a reduction in the amount of waste generated. It allows the efficient return of consumer products back to suppliers. Importantly, reverse distribution also creates markets for excess consumer products, which can be donated or liquidated. Through donation, liquidation, and returning unsold consumer products to suppliers, the Retail Sector reduces the unnecessary creation of waste, puts consumer products to their highest and best use, and furthers the public good by providing additional resources in the form of donations and reduced prices on consumer products in second tier markets. Hence, Walmart believes that EPA should take every step possible to encourage and facilitate the reverse distribution of consumer products. Reverse distribution is synonymous with resource conservation and recovery and ultimately reduces the generation of waste.

Recommendations: Hazardous Waste - Consumer Products, RCRA and the Retail Sector

In light of President Trump's Executive Order, Walmart respectfully suggests that EPA take this opportunity to address these concerns and make RCRA regulation more effective and less burdensome on the Retail Sector. Specifically, Walmart asks EPA to carefully consider and implement the following suggestions:

1. Amend 40 CFR 261.4(b)(1) to include Consumer Products as Household Waste regardless of the location of their generation.

Walmart respectfully requests that EPA consider amending RCRA so that consumer products are managed in a similar way as household waste pursuant to RCRA Subtitle D regardless of where waste consumer products are generated. This could be accomplished by amending the current household waste exclusion in 40 CFR 261.4(b)(1) to include discarded consumer products typically found in household trash and garbage. Walmart believes EPA could resolve the majority of the issues of the regulatory fit between RCRA and the Retail Sector by acknowledging that discarded consumer products fit within the household waste exclusion under RCRA.

The definition could be amended as follows:

Household waste means garbage and trash composed primarily of materials typically found in the waste generated by consumers in their homes (including discarded consumer products, yard waste, and sanitary wastes in septic tanks).

¹¹ Walmart Return Centers process in excess of one billion dollars of credit each year. This figure does not include the additional revenues generated at the Return Centers through liquidation, recycling, and tax benefits from donations. See page 48 of Walmart's response to the NODA.

As an alternative to excluding all consumer products under the household waste exclusion in 40 CFR 261.4(b)(1), Walmart proposes that EPA consider including “consumable” consumer products as an additional exclusion under 40 CFR 261.4(b). These products are regulated by other federal agencies and laws and are literally safe to consume.

2. Expansion of Universal Waste Rules to Cover Consumer Products

Another potential solution is to expand the definition of Universal Wastes to include all or some consumer products when discarded by retailers. This proposal would have many positive benefits to retailers but still allow EPA to retain a greater level of regulatory authority than an outright exemption. The Universal Waste rule recognizes that there are some materials that, while technically hazardous waste when discarded, warrant less strict management and disposal requirements because of the limited risks associated with their disposal and the wide-spread nature of their distribution. Consumer products fit well within the Universal Waste framework – there are clearly limited risks associated with their management and disposal since the general public handles and disposes of millions of identical consumer products every day.

Recognizing this as a sensible solution for consumer products, EPA previously began the process of analyzing whether to expand the definition of Universal Waste to include consumer products. In 2007, EPA concluded that adding consumer products in consumer product packaging was “appropriate because these wastes are produced by a various and vast community of generators and are often mismanaged due to... retail chain employees being unfamiliar with the Resource Conservation and Recovery Act regulations. This proposed action will streamline the current regulations governing these wastes, ensuring that... consumer product wastes are properly managed...” 72 Fed. Reg. 23281 (Apr. 30, 2007). Therefore, managing consumer products as Universal Waste has already been reviewed and could be easily implemented.

3. Protect the Legitimate Business Process of Reverse Distribution

Walmart believes that products sent through reverse distribution networks are not yet wastes where there is a legitimate business purpose for shipping them to consolidation points such as accounting, potential credit, return to the supplier, potential liquidation, or potential donation. Until a given consumer product is actually discarded, it is not yet a solid waste under RCRA and cannot therefore, be a hazardous waste. To clarify its position, EPA could simply reiterate in new guidance the statement it has previously made in the 2008 preamble to the proposed Pharmaceutical Waste Rule¹², expanding its logic to all consumer products. An alternative would be to amend 40 CFR 261.4(a) to explicitly state that consumer products in reverse distribution are not solid waste.

4. Clarification around Recycling of Aerosol Cans

Under current EPA regulations and guidance, the classification of aerosol cans as wastes or non-wastes, and as hazardous or non-hazardous, varies significantly based on a variety of subtle and confusing factors. Because of the complexity and uncertainty, retailers often handle all their unsold,

¹² See: “Amendment to the Universal Waste Rule: Addition of Pharmaceuticals, Proposed Rule; Federal Register Vol. 73, No. 232. (December 2, 2008).

returned, or used aerosols as fully regulated hazardous wastes, despite the fact that the products pose little or no risk to human health and the environment. As a result aerosol cans now account for approximately half of Walmart's hazardous waste stream. Walmart strongly urges EPA to partner with the retail industry to develop clear and simple guidance on the status of aerosol cans, clarify they are not hazardous if recycled by the retailer, and to issue a federal rule classifying waste aerosol cans as universal wastes.

5. Exemption of Nicotine Replacement Therapy Products from RCRA Regulation

Current EPA regulations classify nicotine replacement therapy products -- such as nicotine patches, gums, lozenges, and e-cigarettes -- as "acutely hazardous waste." This classification stems from an outdated regulation issued in 1980 when the only nicotine products on the market were pesticides containing up to 40 percent nicotine.

Nicotine replacement therapy products are clearly not acutely hazardous. Medical professionals recommend that their patients, our customers, apply these products to their skin or chew them to help quit smoking tobacco. There is no reason why the EPA should continue to classify these products as acutely hazardous wastes when they are disposed. Walmart strongly urges EPA to reclassify nicotine replacement therapy products as "non-acutely hazardous waste."

6. Repeal of the Final Rule on Hazardous Waste Generator Improvements

Finally, for several years, the retail sector urged EPA to work with us to address problems with RCRA being applied to the retail sector. While last September, EPA published a strategy for addressing the unique challenges the retail sector faces under RCRA, it subsequently issued the hazardous waste generator rule, which was actually a big step in the wrong direction. As applied to the retail sector, the compliance costs under the final rule will vastly outweigh any environmental benefit. Walmart strongly urges the EPA to repeal the rule, or at least delay the effective date of the rule so that the Agency can conduct a thorough review of the impacts to the retail sector. If the agency expects the retail sector to benefit from the LQG consolidation process as outlined, it needs to ensure it is considered more stringent (and it is as compared to disposal as municipal solid waste) so that it must be adopted by all states. Otherwise, this supposed benefit will not be practical across multiple states.

2. Refrigeration – Retail Supermarket

EPA has previously finalized several changes to the listing status of certain substitute refrigerants along with their related management requirements in commercial refrigeration systems under SNAP and the CAA. EPA's stated dual objectives prompting these rulemakings were the elimination of substitute refrigerants which pose a risk to human health and the environment along with a reduction of releases associated with the use of these substances in commercial and industrial process refrigeration

appliances.¹³ While these goals are laudable, the cumulative effect of EPA's rulemakings with respect to supermarket refrigeration systems has created an undue regulatory burden that will be difficult to navigate as Walmart works to ensure compliance.

A. Impact of SNAP Final Rule

Section 612 of the CAA gives EPA the authority to regulate ozone-depleting and high global warming potential ("GWP") substances by giving the agency the ability to periodically delist certain of these substances from accepted use in both the public and private sector. This grant of authority allows EPA to regulate the use of refrigerants, including those refrigerants used in commercial cooling, industrial process refrigeration, and supermarket retail refrigeration. On August 6, 2014, EPA published its proposed rule to delist R-404A, R-422D, and R-507A as acceptable refrigerants in supermarket refrigeration systems. Numerous manufacturers, suppliers, and end-users representing a varied cross-section of businesses entities and trade associations commented on the proposed rule. Walmart collaborated on and endorsed comments submitted by the Food Marketers Institute ("FMI") in response to the proposed rule.

Walmart operates approximately 5,000 locations across the United States. More than half of these locations currently utilize refrigerants that EPA has recently delisted under the SNAP program.¹⁴ Under the SNAP Final Rule, these systems will require future replacement or conversion at the end of their "useful life."¹⁵ The SNAP Final Rule prohibits any new commercial refrigeration system¹⁶ installed after January 1, 2017 from utilizing R-404A, R-422D, and R-507A. EPA interprets "new system" to be synonymous with new appliance, which is defined by "the date upon which the [system or] appliance's refrigerant circuit is complete, the appliance can function, the appliance holds a full refrigerant charge, and the appliance is ready for use for its intended purposes."¹⁷

Under the regulations, an existing system which supports, for example, a series of supermarket display cases would only be considered "new" if a remodel or expansion of that system "changes the intended purpose of the original equipment, for instance by adding additional cases, compressors, and refrigerant that were not supported by the original compressor system."¹⁸ However, EPA qualified this regulatory language in guidance by referencing a fact sheet that helped explain changes to the R-22 phase-out in 2010. In that referenced guidance document, EPA stated that a supermarket may undergo

¹³ See: "Protection of Stratospheric Ozone: Update to the Refrigerant Management Requirements under the Clean Air Act"; Final Rule; 40 CFR Part 82 Vol. 80, No. 223. (November 16, 2016).

¹⁴ Walmart has 484 locations which use R-22, 2345 locations which use R-404A, 319 locations which use R-422D, and 3 locations which use R-507A for their centralized refrigeration system.

¹⁵ "Useful life" is not defined under the SNAP program at § 40 CFR 82.172 or at U.S. Code § 7411 of the CAA.

¹⁶ EPA is somewhat unclear as to what constitutes a "system" under the final rule. Walmart interprets EPA to mean that that a "system" comprises the individual circuit which contains compressors, condensers, evaporators, or other components of a refrigeration loop, and not the entire series of "racks" used by a store. This is supported by EPA in its commentary restated here: "Rather such units would fall within the end-use category "supermarket system" if the refrigerant is supplied on the same multi-compressor circuit used to cool food elsewhere in the store." See: 80 Fed. Reg. at 42901.

¹⁷ See: 40 CFR 82.3, 82.302

¹⁸ See: 80 Fed. Reg. at 42903.

an expansion and continue to use the existing refrigerant only “if there is sufficient cooling capacity within the system to support the expansion.”¹⁹

EPA did agree with FMI’s 2014 comments concerning the changes to display cases, indicating that replacement of display cases with cases that operate at higher evaporator temperatures would not deem the system supporting these cases as “new,” as the resulting increased system efficiency would not be in contravention of the system’s original intended purpose.²⁰ Similarly, EPA agreed that installing new compressors or condensers which were designed for a refrigeration system’s original capabilities would also be considered by EPA as a servicing or maintenance event, not triggering the redefining of the system as “new,” and thus not mandating a change of refrigerant.

While Walmart is thankful EPA has taken those positions, we are still very concerned that the practical effect of EPA’s interpretation still may have the result of essentially defeating its original intent behind the grandfathering of existing systems throughout their “useful life” because minor additions to systems common in store remodels, such as the addition of a produce or cheese island, could trigger an immediate change of refrigerant. Under the SNAP Final Rule, EPA has codified that any expansion including the addition of one or more compressors to a refrigerant system that increases cooling capacity would deem the refrigerant system (or circuit) to be a “new system,” necessitating a transition to a new SNAP-approved refrigerant with a lower GWP. Thus, existing refrigeration systems in stores undergoing remodels and expansions can continue to be maintained and serviced for the useful life of the equipment using delisted refrigerants, including R-404A, R-422D, and R-507A—only so long as additional refrigeration capacity, no matter how incremental, is not added to the system.

In practice, without the option of making small cooling capacity increases to supermarket refrigeration systems using delisted refrigerants, the effect of SNAP Final Rule is to relegate businesses, and especially retail businesses attempting to make minor additions to refrigerated offerings, into 1) undergoing complete refrigerant conversions to SNAP-approved refrigerants, or 2) utilizing remote condensing units (“RCUs”)²¹ or stand-alone cases.

First, the refrigerant conversions of systems using, for example R-404A, to SNAP-approved refrigerants such as R-407A/C, can represent a significant financial and operational impact to the store. As indicated, nearly half of Walmart’s facilities use R-404A in their centralized refrigeration systems. These existing facilities are scheduled to be remodeled in the next 3-5 years, adding refrigerated space in small applications such as multi-deck beer cases, produce or cheese islands, liquor-box additions, or bakery and deli expansions. Conservatively, this approach in dealing with the SNAP Final Rule would be an undue burden in compliance costs incurred by Walmart, as well as the retail sector broadly, when business decisions surrounding remodel programs prompt a need for refrigerant conversions.²² Assuming a similar timeline for the delisting of both R-22 and R-404A, Walmart has concerns that after transitioning to refrigerants such as R-407A/C in the short term, it will once again be faced with the

¹⁹ See: http://www.epa.gov/ozone/title6/phaseout/Supermarket_Q&A_for_R-22.html

²⁰ See: 80 Fed. Reg. at 42903.

²¹ EPA states that “remote condensing” is used to indicate systems where the condensing unit and compressors are located remotely from where food is stored or displayed and instead the refrigerant or secondary-fluid is piped to the cases or rooms where the food is located. See: 80 Fed. Reg. at 42901.

²² Assuming the least costly scenario, where only 1/3 of remodels would be extensive enough so as to warrant a complete conversion.

prospect of having to transition a large portion of its fleet of stores away from R-407A/C as other substitute refrigerants with lower GWPs become more economically practical and commercially available.

Second, the use of RCUs or stand-alone cases to support minor additions to refrigerated space presents other problems related to accessibility and monitoring. RCUs can be more costly in terms of installation, servicing and/or maintenance repair work. Due to other recently enacted regulations,²³ this would impose even more of a burden on businesses needing to install multiple RCUs to achieve desired refrigeration objectives during expansions or store remodels. The commercial availability of RCUs utilizing multiple compressor technologies coupled with the current limited capacity selections, results in units that are oversized, making them unsuitable or difficult to use in small expansions during a store remodel. Stand-alone units and hermetically sealed RCUs, which are more widely available and use acceptable refrigerants, are often more costly. Moreover, these potential options could actually be counterproductive to the intent of the SNAP Final Rule. Stand-alone units have the condensing unit embedded into the specific case they support, which increases overall energy consumption (and thus carbon footprint) due to the necessity of expelling the heat produced by their operation through the building air conditioning system. RCUs being developed by industry and operating with R-448/449 are still undergoing required safety testing, with no exact timeline of broad commercial availability.

Walmart recognizes that the intent of the SNAP Final Rule is for businesses to transition away from the use of refrigerants with high GWPs that could harm the environment. However, Walmart feels that the current structure of the regulation, including the previously enacted and proposed phase-out dates for refrigerants (particularly R-404A in centralized systems and RCUs) does not allow for alternatives to be employed which provide adequate flexibility to businesses in the retail sector while simultaneously decreasing high GWP refrigerant emissions. Accordingly, Walmart encourages EPA to allow for refrigeration systems utilizing R-404A, R-422D, and R-507A to increase cooling capacity by a preset limit of 15% of the system's original capacity. This change would serve multiple purposes:

- Preserving EPA's intent of allowing grandfathered refrigeration systems to be used for the duration of their useful life without the need for complete refrigerant conversions to SNAP-approved refrigerants during remodels that only minimally change the intent and capacity of the system, as a minor remodel is very common during the useful life of the equipment.
- Allowing more time for manufacturers of RCUs utilizing SNAP-approved refrigerants to make available units designed for smaller applications and which are more energy efficient.

Alternatively, if EPA is unwilling to allow for any increased usage of R-404A, R-422D, and R-507A in existing systems, Walmart suggests prolonging the phase-out date of January 1, 2018 for RCUs utilizing R-404A, R-422D, and R-507A to January 1, 2020. By EPA's own assessment, the delisting of

²³ See: *Infra*. (Leak inspection requirements under the Refrigerant Management Final Rule).

RCUs using R-404A, R-422D, and R-507A is only expected to account for approximately 3% of the total emissions reduction under the SNAP Final Rule through 2020.²⁴

In conclusion, EPA should reassess its position on the phase-out of certain refrigerants (and in particular, R-404A) under the SNAP Final Rule.

B. Impact of Refrigerant Management Requirements Final Rule

Walmart previously provided comments to EPA regarding its Update to the Refrigerant Management Requirements under the Clean Air Act Final Rule.²⁵ In its proposal, EPA requested comment on whether the leak rate triggering a leak repair should be reduced from 35% to 20% for commercial refrigeration appliances and from 20% to 10% for comfort cooling appliances.²⁶ Walmart agreed with this portion of the proposed rule, as well as the requirement that once a leak repair is triggered by an appliance breaching the preset threshold, all leaks (within a certain scope of practicality)²⁷ would need to be repaired. In its Final Rule, EPA not only lowered the applicable leak rates requiring a repair in these instances, but also used these leak rates as a basis to trigger quarterly and annual leak inspections. Because the Final Rule requires that all leaks be repaired once the applicable leak rates are breached, mandating that an appliance be inspected on a recurring basis after being completely repaired and passing follow-up verification testing will be of negligible benefit to reducing emissions from these stationary sources. If an appliance has been completely repaired and its system parameters can be monitored remotely from a different location, substantial economic waste would be incurred by businesses conducting leak inspections on appliances that are not leaking.

In its commentary to the proposed rule, Walmart voiced several concerns surrounding mandatory leak inspections, including the unavailability of qualified refrigeration service technicians to perform leak inspections on commercial refrigeration and comfort cooling appliances, the uncertainty surrounding the definition of “leak inspection,” as well as safety concerns that would arise should, as EPA suggested, “someone” perform the leak inspections as oppose to in-house or third-party service technicians.²⁸ In an effort to reiterate these concerns, Walmart encourages the Agency to look at several industry articles and other publications outlining the scarcity of qualified service technicians^{29,30} entering the

²⁴ See: “Climate Benefits of the SNAP Program Status Rule Change”; (July 2015). EPA estimates that the SNAP Final Rule will reduce emissions of target refrigerants in RCUs by 1 million metric tons of carbon dioxide equivalent (“MMTCO₂eq”). By comparison, the entire program is estimated to reduce emissions by 29.5 MMTCO₂eq. $1/29.5 \times 100 = 3.389\%$

²⁵ See: EPA-HQ-OAR-2015-0453; Letter to EPA Docket Center from Rick Leahy, Vice President, Walmart EH&S Compliance, (January 25, 2016)

²⁶ 40 CFR Part 82. Vol. 80. No. 216 at 69510

²⁷ See: *Id.* at 69495. “EPA is seeking comments on whether the agency should create a limited exception, which would provide that if upon further inspection (through bubble tests or other means), sound professional judgment indicates an individual identified leak is not the result of a faulty component or connection and that refrigerant releases would not be reduced from repair or adjustment, the leak would not need to be repaired. If this proposal is finalized, EPA would likely require that the justification for the determination be noted in the appliance’s service records. EPA notes that there are certain types of situations that would never meet these conditions, including but not limited to when a component has holes, cracks, or improperly seated seals. All other leaks would still need to be repaired if the applicable leak rate is exceeded.”

²⁸ EPA-HQ-OAR-2015-0453; Letter to EPA Docket Center from Rick Leahy, Vice President, Walmart EH&S Compliance, (January 25, 2016)

²⁹ See: <http://www.achrnews.com/articles/128114-solving-the-hvacr-technician-shortage>

labor force. When coupled with the number of retirees expected to leave the industry over the next few years, the strain on local markets attempting to hire qualified technicians will be very significant. In turn, wages for workers and associated service call rates could increase, increasing the costs to businesses trying to conduct their operations compliantly in an uncertain economic climate.

Recommendations: Retail Supermarket Refrigeration

Walmart strongly encourages EPA to reassess some of the aspects and cumulative impacts of the SNAP Final Rule and the Refrigerant Management Requirements Final Rule. As alternatives, Walmart asks EPA to carefully consider:

1. Allowing supermarkets the flexibility to make the kind of minor expansions of existing systems that are typical during a remodel, such as adding a produce or cheese island, utilizing existing refrigerants, as long as the minor changes don't significantly alter the intent or capacity of the system until other options are available.
2. Revising the refrigerant management requirements so that systems that have undergone previous repairs to *all* leaks would not be subject to annual or quarterly leak inspections.

Conclusion

Walmart truly appreciates EPA granting it the opportunity to submit these comments. Moving forward, Walmart stands ready to work with EPA to follow up on any or all of the specific issues mentioned or other areas with unique impacts to the retail sector. Walmart is open to providing additional information or data to EPA and is available to answer questions EPA might have. By working together in an open and cooperative manner, Walmart believes it is possible to design and implement regulations that are protective of human health and the environment and make sound business sense.

³⁰ See: http://www.careersinhvacr.org/Portals/_Appleseed/documents/Executive%20Summary.pdf



E. SCOTT PRUITT
ADMINISTRATOR

July 13, 2017

Ms. Tracee Bentley
Executive Director
Colorado Petroleum Council
1660 Lincoln Street, Suite 2320
Denver, Colorado 80264

RE: EPA Clean Air Act Compliance Assurance Activities in the Oil and Gas Sector

Dear Ms. Bentley:

Thank you for sharing your concerns regarding the U.S. Environmental Protection Agency's Clean Air Act enforcement and compliance assurance activities in the oil and gas sector. We discussed the concerns raised in your correspondence with involved staff at the EPA and the Colorado Department of Public Health and Environment. We are focused on increased coordination and collaboration among the EPA, our state partners and oil and gas producers.

The agency acknowledges the critical role that the oil and gas industry plays in ensuring the nation's energy independence through domestic energy production. We are committed to working with the oil and gas industry and our state partners to ensure domestic oil and gas production occurs in a safe and responsible manner and in compliance with applicable environmental laws. We recognize the efforts industry and our state partners have made to reduce excess emissions from oil and gas operations in order to protect and improve the nation's air quality.

The agency plans to continue to work cooperatively with CDPHE on investigations of oil and gas operations and other compliance assurance activities. We are particularly focused on the Denver-Julesburg Basin because of its place in the Denver Metro/Front Range ozone nonattainment area. The EPA anticipates that the state will take the lead in pursuing state-only enforcement actions in the basin and throughout Colorado. The EPA will generally defer to the state where the state wishes to pursue state-only action and will join the State on a limited, as requested basis. The EPA will take the lead on oil and gas compliance assurance activities on operations in Indian country in Colorado.

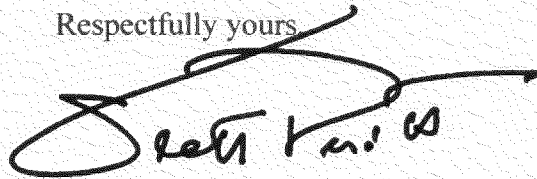


Your letter raises broad concerns about the agency's relationships and communications involving the oil and gas sector. To begin to address those concerns, I have directed agency staff to take the following steps:

1. Each region will work with their counterpart state oil and gas regulatory agencies to enhance existing relationships and define EPA/state lead responsibilities on compliance and enforcement work to eliminate duplication of efforts. This may include discussions of tools to promote compliance in the oil and gas sector, joint planning and a process for elevating any material disagreements with states that cannot be resolved in the normal course of business.
2. Nationally, we will develop best practices for the judicious use of Clean Air Act section 114 information requests in the oil and gas sector, such as tailoring requests to potential violations and elevating for senior policy consideration any planned information requests that meet certain criteria.
3. We plan to convene a roundtable with representatives of the oil and gas sector and state regulatory agencies to discuss industry concerns and enhance communication while ensuring safe and responsible domestic oil and gas production.

I hope these steps will help to address your concerns and provide a solid basis for our continuing partnership with state agencies. We welcome your ideas in this regard. Please contact Deb Thomas, Region 8 Acting Regional Administrator, at (303) 312-6532 with any questions or recommendations you may have.

Respectfully yours

A handwritten signature in black ink, appearing to read "E. Scott Pruitt", with a large, sweeping flourish extending to the right.

E. Scott Pruitt

cc: Deb Thomas
Acting Regional Administrator, Region 8

Larry Starfield, Acting Assistant Administrator
Office of Enforcement and Compliance Assurance

Patrick Traylor, Deputy Assistant Administrator
Office of Enforcement and Compliance Assurance

Patrick Davis, Deputy Assistant Administrator
Office of Land and Emergency Management



E. SCOTT PRUITT
ADMINISTRATOR

July 11, 2017

Ms. Angie Binder
Executive Director
Colorado Petroleum Association
1700 Lincoln Street, Suite 1530
Denver, Colorado 80203

RE: EPA Clean Air Act Compliance Assurance Activities in the Oil and Gas Sector

Dear Ms. Binder:

Thank you for sharing your concerns regarding the U.S. Environmental Protection Agency's Clean Air Act enforcement and compliance assurance activities in the oil and gas sector. We discussed the concerns raised in your correspondence with involved staff at the EPA and the Colorado Department of Public Health and Environment. We are focused on increased coordination and collaboration among the EPA, our state partners and oil and gas producers.

The EPA acknowledges the critical role that the oil and gas industry plays in ensuring the nation's energy independence through domestic energy production. We are committed to working with the oil and gas industry and our state partners to ensure domestic oil and gas production occurs in a safe and responsible manner and in compliance with applicable environmental laws. We recognize the efforts industry and our state partners have made to reduce excess emissions from oil and gas operations in order to protect and improve the nation's air quality.

The agency plans to continue to work cooperatively with CDPHE on investigations of oil and gas operations and other compliance assurance activities. We are particularly focused on the Denver-Julesburg Basin because of its place in the Denver Metro/Front Range ozone nonattainment area. The EPA anticipates that the state of Colorado will take the lead in pursuing state-only enforcement actions in the Basin and throughout Colorado. The EPA will generally defer to the state where the state wishes to pursue state-only action and will join the state on a limited, as-requested basis. The EPA will take the lead on oil and gas compliance assurance activities on operations in Indian country in Colorado.

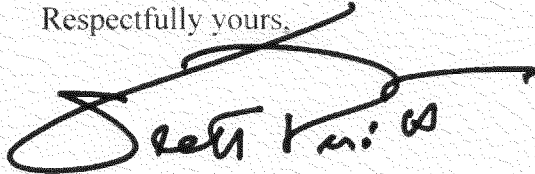


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cc: Deb Thomas, Acting Regional Administrator, Region 8

Larry Starfield, Acting Assistant Administrator
Office of Enforcement and Compliance Assurance

Patrick Traylor, Deputy Assistant Administrator
Office of Enforcement and Compliance Assurance

Patrick Davis, Deputy Assistant Administrator
Office of Land and Emergency Management



E. SCOTT PRUITT
ADMINISTRATOR

July 14, 2017

Colorado Association of Commerce
and Industry Energy Committee
1600 Broadway, Suite 1000
Denver, Colorado 80202-4935

RE: EPA Clean Air Act Compliance Assurance Activities in the Oil and Gas Sector

Dear CACI Energy Committee:

Thank you for sharing your concerns regarding the U.S. Environmental Protection Agency's Clean Air Act enforcement and compliance assurance activities in the oil and gas sector. We discussed the concerns raised in your correspondence with involved staff at the EPA and the Colorado Department of Public Health and Environment. We are focused on increased coordination and collaboration among the EPA, our state partners and oil and gas producers.

The agency acknowledges the critical role that the oil and gas industry plays in ensuring the nation's energy independence through domestic energy production. We are committed to working with the oil and gas industry and our state partners to ensure domestic oil and gas production occurs in a safe and responsible manner and in compliance with applicable environmental laws. We recognize the efforts industry and our state partners have made to reduce excess emissions from oil and gas operations in order to protect and improve the nation's air quality.

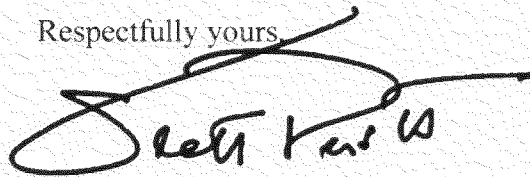
The agency plans to continue to work cooperatively with CDPHE on investigations of oil and gas operations and other compliance assurance activities. We are particularly focused on the Denver-Julesburg Basin because of its place in the Denver Metro/Front Range ozone nonattainment area. The EPA anticipates that the state will take the lead in pursuing state-only enforcement actions in the basin and throughout Colorado. The EPA will generally defer to the state where the state wishes to pursue state-only action, and will join the state on a limited, as requested basis. The EPA will take the lead on oil and gas compliance assurance activities on operations in Indian country in Colorado.

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Office of Land and Emergency Management



E. SCOTT PRUITT
ADMINISTRATOR

July 11, 2017

Mr. Dan Haley
President and Chief Executive Officer
Colorado Oil and Gas Association
1800 Glenarm Place, Suite 1100
Denver, Colorado 80202

RE: EPA Clean Air Act Compliance Assurance Activities in the Oil and Gas Sector

Dear Mr. Haley:

Thank you for sharing your concerns regarding the U.S. Environmental Protection Agency's Clean Air Act enforcement and compliance assurance activities in the oil and gas sector. We discussed the concerns raised in your correspondence with involved staff at the EPA and the Colorado Department of Public Health and Environment. We are focused on increased coordination and collaboration among the EPA, our state partners and oil and gas producers.

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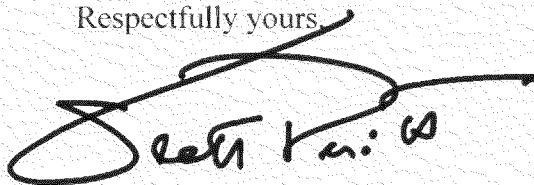


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Patrick Traylor, Deputy Assistant Administrator
Office of Enforcement and Compliance Assurance

Patrick Davis, Deputy Assistant Administrator
Office of Land and Emergency Management



E. SCOTT PRUITT
ADMINISTRATOR

July 11, 2017

Mr. Ron Ness
President
North Dakota Petroleum Council
100 West Broadway, Suite 200
P.O. Box 1395
Bismarck, North Dakota 58501

RE: EPA Clean Air Act Compliance Assurance Activities in the Oil and Gas Sector

Dear Mr. Ness:

Thank you for sharing your concerns regarding the U.S. Environmental Protection Agency's Clean Air Act enforcement and compliance assurance activities in the oil and gas sector. We discussed the concerns raised in your correspondence with involved staff at the EPA and the North Dakota Department of Health. We are focused on increased coordination and collaboration among the EPA, our state partners and oil and gas producers.

The EPA acknowledges the critical role that the oil and gas industry plays in ensuring the nation's energy independence through domestic energy production. We are committed to working with the oil and gas industry and our state partners to ensure domestic oil and gas production occurs in a safe and responsible manner and in compliance with applicable environmental laws. We recognize the efforts industry and our state partners have made to reduce excess emissions from oil and gas operations in order to protect and improve the nation's air quality.

The agency intends to continue working with NDDH to address violations and reduce Bakken oil and gas emissions. Going forward, the EPA plans to focus its Bakken oil and gas compliance assurance activities on operations on the Fort Berthold Indian Reservation where the state does not have Clean Air Act authority, and NDDH will focus its efforts on operations outside of Indian country. Close coordination on these efforts will help to ensure a level playing field.

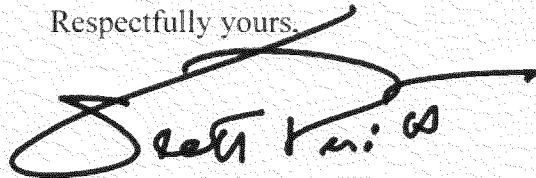
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1. Each region will work with their counterpart state oil and gas regulatory agencies to enhance existing relationships and define EPA/state-lead responsibilities on compliance and enforcement work to eliminate duplication of efforts. This may include discussions of tools to promote compliance in the oil and gas sector, joint planning and a process for elevating any material disagreements with states that cannot be resolved in the normal course of business.
2. Nationally, we will develop best practices for the judicious use of Clean Air Act section 114 information requests in the oil and gas sector, such as tailoring requests to potential violations and elevating for senior policy consideration any planned information requests that meet certain criteria.
3. We plan to convene a roundtable with representatives of the oil and gas sector and state regulatory agencies to discuss industry concerns and enhance communication while ensuring safe and responsible domestic oil and gas production.

I hope these steps will help to address your concerns and provide a solid basis for our continuing partnership with state agencies. We welcome your ideas in this regard. Please contact Deb Thomas, Region 8 Acting Regional Administrator, at (303) 312-6532 with any questions or recommendations you may have.

Respectfully yours,

A handwritten signature in black ink, appearing to read "E. Scott Pruitt", with a large, stylized flourish extending from the end of the signature.

E. Scott Pruitt

cc: Deb Thomas, Acting Regional Administrator, Region 8

Larry Starfield, Acting Assistant Administrator
Office of Enforcement and Compliance Assurance

Patrick Traylor, Deputy Assistant Administrator
Office of Enforcement and Compliance Assurance

Patrick Davis, Deputy Assistant Administrator
Office of Land and Emergency Management



E. SCOTT PRUITT
ADMINISTRATOR

July 10, 2017

Ms. Kathleen Sgamma
President
Western Energy Alliance
1775 Sherman Street, Suite 2700
Denver, Colorado 80203

RE: EPA Clean Air Act Compliance Assurance Activities in the Oil and Gas Sector

Dear Ms. Sgamma:

Thank you for sharing your concerns regarding the U.S. Environmental Protection Agency's Clean Air Act enforcement and compliance assurance activities in the oil and gas sector. We discussed the concerns raised in your correspondence with involved staff at the EPA, the Colorado Department of Public Health and Environment and the North Dakota Department of Health. We are focused on increased coordination and collaboration among the EPA, our state partners and oil and gas producers.

The EPA acknowledges the critical role that the oil and gas industry plays in ensuring the nation's energy independence through domestic energy production. We are committed to working with the oil and gas industry and our state partners to ensure domestic oil and gas production occurs in a safe and responsible manner and in compliance with applicable environmental laws. We recognize the efforts industry and our state partners have made to reduce excess emissions from oil and gas operations in order to protect and improve the nation's air quality.

The agency intends to continue working with NDDH to address violations and reduce Bakken oil and gas emissions. Going forward, the EPA plans to focus its Bakken oil and gas compliance assurance activities on operations on the Fort Berthold Indian Reservation where the state does not have Clean Air Act authority, and NDDH will focus its efforts on operations outside of Indian country. Close coordination on these efforts will help to ensure a level playing field.

We plan to continue to work cooperatively with CDPHE on investigations of oil and gas operations and other compliance assurance activities. We are particularly focused on the Denver-Julesburg Basin because of its place in the Denver Metro/Front Range ozone nonattainment area. The EPA anticipates that the state of Colorado will take the lead in pursuing state-only enforcement actions in the Basin and throughout Colorado. The EPA will generally defer to the state where the

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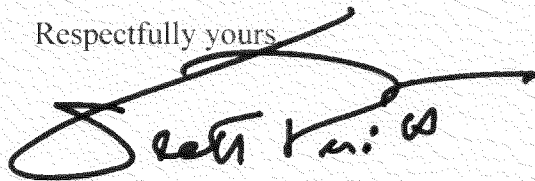
state wishes to pursue state-only action and will join the state on a limited, as-requested basis. The EPA will take the lead on oil and gas compliance assurance activities on operations in Indian country in Colorado.

Your letter raises broad concerns about the agency's relationships and communications involving the oil and gas sector. To begin to address those concerns, I have directed agency staff to take the following steps:

1. Each region will work with their counterpart state oil and gas regulatory agencies to enhance existing relationships and define EPA/state-lead responsibilities on compliance and enforcement work to eliminate duplication of efforts. This may include discussions of tools to promote compliance in the oil and gas sector, joint planning and a process for elevating any material disagreements with states that cannot be resolved in the normal course of business.
2. Nationally, we will develop best practices for the judicious use of Clean Air Act section 114 information requests in the oil and gas sector, such as tailoring requests to potential violations and elevating for senior policy consideration any planned information requests that meet certain criteria.
3. We plan to convene a roundtable with representatives of the oil and gas sector and state regulatory agencies to discuss industry concerns and enhance communication while ensuring safe and responsible domestic oil and gas production.

I hope these steps will help to address your concerns and provide a solid basis for our continuing partnership with state agencies. We welcome your ideas in this regard. Please contact Deb Thomas, Region 8 Acting Regional Administrator, at (303) 312-6532 with any questions or recommendations you may have.

Respectfully yours,

A handwritten signature in black ink, appearing to read "E. Scott Pruitt", with a large, sweeping flourish extending from the end of the signature.

E. Scott Pruitt

cc: Deb Thomas, Acting Regional Administrator, Region 8

Larry Starfield, Acting Assistant Administrator
Office of Enforcement and Compliance Assurance

Patrick Traylor, Deputy Assistant Administrator
Office of Enforcement and Compliance Assurance

Patrick Davis, Deputy Assistant Administrator
Office of Land and Emergency Management

To: Jackson, Ryan[jackson.ryan@epa.gov]
From: POLITICO Pro Energy Whiteboard
Sent: Wed 6/21/2017 2:52:24 PM
Subject: Interior outlines regulatory reform plans

By Esther Whieldon

06/21/2017 10:48 AM EDT

The Interior Department has outlined its regulatory review plans, which largely encompass rethinking regulations involving the oil and gas industry.

The notice, which is slated to be published in the Federal Register on Thursday, provides more detail about Interior's ongoing efforts to implement President Donald Trump's regulatory reform goals. Among other steps, the agency said it intends to use more advanced notices of proposed rulemakings "to solicit input on the front end as to how any given regulatory action could be tailored to reduce or eliminate burden."

Interior's regulatory reform task force will review several Obama-era rules on energy development that may be repealed or revised. Stemming from that effort, BLM has already said it will rewrite its hydraulic fracturing rule. Other rules being looked at include BLM's methane waste rule and regulations involving offshore energy development.

The agency also said it is implementing Trump's order that directed agencies to identify two rules for repeal every time a new regulation is adopted.

WHAT'S NEXT: Interior is accepting comments on its reviews but did not set a hard deadline, instead saying it will "review comments on an ongoing basis."

To view online:

<https://www.politicopro.com/energy/whiteboard/2017/06/interior-outlines-regulatory-reform-plans-089434>

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This email was sent to jackson.ryan@epa.gov by: POLITICO, LLC 1000 Wilson Blvd.
Arlington, VA, 22209, USA

To: Freire, JP[Freire.JP@epa.gov]
From: Jackson, Ryan
Sent: Sun 4/23/2017 7:55:08 PM
Subject: FW: EPA Response to DOC Plan to Streamline Permitting and Reduce Regulatory Burdens for Domestic Manufacturing
FINAL EPA Response to Commerce 4-21-2017 with appendix.pdf

This is what I was talking about this morning.

From: Bolen, Brittany
Sent: Friday, April 21, 2017 5:33 PM
To: Jackson, Ryan <jackson.ryan@epa.gov>; Brown, Byron <brown.byron@epa.gov>
Cc: Dravis, Samantha <dravis.samantha@epa.gov>
Subject: FW: EPA Response to DOC Plan to Streamline Permitting and Reduce Regulatory Burdens for Domestic Manufacturing

Ryan and Byron – wanted to make sure you had a copy of the final submission to Commerce.

From: Dravis, Samantha
Sent: Friday, April 21, 2017 4:51 PM
To: Comstock, Earl (Federal) <EComstock@doc.gov>
Cc: Bolen, Brittany <bolen.brittany@epa.gov>; Shaw, Nena <Shaw.Nena@epa.gov>
Subject: EPA Response to DOC Plan to Streamline Permitting and Reduce Regulatory Burdens for Domestic Manufacturing

RE: EPA's Input to the Department of Commerce's Plan to Streamline Permitting and Reduce Regulatory Burdens for Domestic Manufacturing

Dear Mr. Comstock:

Thank you for your leadership on the January 24, 2017 Presidential Memorandum on "Streamlining Permitting and Reducing Regulatory Burdens for Domestic Manufacturing." At the interagency coordinating meeting on March 28, 2017, participating agencies were asked to

provide to the Department of Commerce responses to the following four requests: (1) Briefly describe any of your agency's reforms in progress now that pertain to this effort; (2) Provide specific regulatory reform targets regarding your Agency; (3) Provide a brief description of permitting processes related to manufacturing and describe ways they may be simplified; and (4) Other advice and input as desired.

Environmental permitting can be a complex and burdensome system for domestic manufacturers to navigate as they seek to expand and create economic growth, and delays result in negative impacts for new projects and improvements manufacturers seek to make. The costs associated with environmental permitting are not well documented. The "hidden cost of environmental regulation" includes facilities that are never built and jobs never created because of environmental permitting.

We can and need to do better to streamline these processes while continuing to protect human health and the environment. The process started by this Presidential Memorandum is just the beginning. In the attached Executive Summary and the body of EPA's response, we are proposing a range of reforms including modernizing the NPDES regulatory requirements consistent with CWA amendments and recent case law, as well as revising Title V regulations to streamline and clarify processes related to the submission and review of Title V petitions. These and other streamlining efforts will help provide the certainty and timeliness important for fostering an environment for economic growth. Administrator Pruitt is committed to bringing EPA back-to-basics, and streamlining our permitting processes to create economic and job growth in the manufacturing sector is crucial to that effort.

I sincerely hope EPA's submission assists the Department of Commerce in developing a comprehensive Permit Streamlining Action Plan (Action Plan). If you have any questions, please feel free to contact me or Brittany Bolen at bolen.brittany@epa.gov.

Regards,
Samantha

Samantha Dravis
Senior Counsel/Associate Administrator for Policy
U.S. Environmental Protection Agency

To: Pruitt, Scott[Pruitt.Scott@epa.gov]
From: Jeffrey McIlroy
Sent: Mon 5/1/2017 8:25:56 PM
Subject: Great Responsibility

Mr. Pruitt,

I would like to personally congratulate you as the newest Administrator to the Environmental Protection Agency.

I can only hope that you rely on the very capable/intelligent staff of scientists that the EPA employs and subcontracts for objective information on environmental concerns. I am urging to make the right decisions for our nation, not based on preconceived bias or opinion, but based on scientific evidence and factual data.

I am writing to express my concern over some of the recently proposed legislation concerning air/water quality regulations and the lack of concern over climate change. I am specifically referring to executive order 13777 (and others like it), which has initiated a review of "regulatory burdens" that impact businesses. As it pertains to the EPA, this is a complete re-evaluation of emissions standards and effluents from industry.

These regulations are in place to safeguard our water, our air, and ultimately the American people. Of course, the need to create jobs and promote employment for displaced workers is important, but eliminating regulations designed to protect our precious resources is not the answer. Furthermore, the U.S. benefits from tourism, outdoor recreation, and industries that support these endeavors, all of which are dependent on the preservation of natural areas, healthy ecosystems, fisheries, and aesthetically pleasing water-ways.

Fossil fuels are finite resources, and reversing our economy towards a dependency on them is not sustainable, nor does it make our country competitive in the long-run. For example, coal is no longer competitive with renewable energy sources (ie: solar, wind, wave generation). In terms of jobs growth, Wind and Solar jobs alone are increasing at a rate of 20% per year and the industry is adding jobs at a rate that is 12% higher than the rest of the economy.

These renewable technologies are the future of energy innovation and it is in the best interest of our country to invest in them to stay ahead of the market trends (as opposed to falling behind). In addition, our move away from coal (along with emissions controls) has made a significant positive impact on our air quality (I can cite several examples here in my home state of New York: the acid rain in the Adirondack Mountains, and the Smog problem in New York City in the 70's/80's).

Environmental policy and regulation should not be a partisan issue. Our Nation is and always has been a model to the planet. Just like a role model that any of us have looked up to throughout our lives, we need to continually strive to be a positive one. America can be great again, by continuing to lead the world in technology and innovation, instead of focusing on competing in an already established/saturated market.

Protecting the environment and the health of the American people is a matter of National Security. Clean water and clean air must not be compromised for short term gains.

Thank you for your time and I wish you the best in your position. Yours is a position that the American People hold to a very high regard and we are all counting on you to make the right decisions for not only the current population, but generations to come.

-Jeff McIlroy

"We are do not own this planet (or this country), we are borrowing it from our children"

July 13, 2017

VIA E-MAIL

Attn.: Docket No. EPA-HQ-OAR-2014-0827; Docket No. NHTSA-2014-0132

The Honorable E. Scott Pruitt
Administrator
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue, NW
Washington, DC 20460

Mr. Jack Danielson
Acting Deputy Administrator
National Highway Traffic Safety Administration
1200 New Jersey Ave, SE
Washington, DC 20590

Dear Administrator Pruitt and Acting Deputy Administrator Danielson:

On behalf of our members across the country, we urge EPA and NHTSA to maintain and enforce all provisions of the joint Phase 2 greenhouse gas (GHG) and fuel efficiency standards for medium- and heavy-duty engine and vehicles (Phase 2 standards), a vital public health and environmental safeguard,¹ and respectfully submit these comments on the standards' provisions applicable to heavy-duty trailers.

We understand that the Truck Trailer Manufacturers Association (TTMA) submitted a letter requesting reconsideration and stay to the regulatory docket opened pursuant to Executive Order 13777 on April 3, 2017 ("Apr. 3 letter"),² and that in June, TTMA submitted a "supplemental" petition for reconsideration of the GHG and fuel efficiency standards and stay of the GHG standards to EPA and NHTSA's regulatory dockets for the Phase 2 standards. Though dated June 26, 2017, this supplemental petition was only posted publicly on July 12. And though the April 3 petition references a request for meeting, information regarding any meetings relating to the trailer standards that did take place has not been made publicly available.

¹ Greenhouse Gas Emissions and Fuel Efficiency Standards for Medium- and Heavy-Duty Engines and Vehicles—Phase 2, 81 Fed. Reg. 73478 (Oct. 25, 2016).

² Comment submitted by Jeff Sims, President, Truck Trailer Manufacturers Association, Doc. ID: EPA-HQ-OA-2017-0190-0442, <https://www.regulations.gov/document?D=EPA-HQ-OA-2017-0190-0442>. This letter formed the basis for the agencies' motion to hold the lawsuit over the Phase 2 standards, *Truck Trailer Manufacturers Association v. EPA, et. al.*, No. 16-1430, in abeyance in May 2017.

This lack of transparency is another unfortunate example of what has already emerged as a common practice by this Administration – and this EPA in particular—of engaging in private meetings with industry groups and bowing to corporate demands without allowing any opportunity for public engagement in matters that directly impact the health and welfare of American families.³ This practice is in contravention of longstanding tradition, and highlights the clear need for a restoration of transparency if the agencies are considering changes to standards so vital to the nation’s efforts to address climate change, reduce air pollution, minimize dependence on oil, and strengthen our economy. EPA may not act on these petitions to stay the trailer standards without adhering to basic norms of free and open government: notice and opportunity for public input.

In requesting reconsideration and stay of the trailer standards, TTMA cites as authorities section 307(d)(7)(B) of the Clean Air Act (CAA) and section 705 of the Administrative Procedure Act (APA). Neither of these statutory provisions is available to administratively stay these standards. Moreover, TTMA’s June 26 petition makes legally flawed arguments regarding EPA’s authority to regulate trailers, as well as unsubstantiated and unsound assertions about the feasibility and reasonability of the trailer standards. We address each of these deficiencies in turn.

Neither of the Statutory Authorities TTMA Cites Is Available to Stay the Trailer Standards.

Administrative agencies may act only pursuant to authority delegated to them by Congress.⁴ Neither section 307 of the CAA nor section 705 of the APA provides applicable authority to stay the trailer standards. Any revision to the rule, including revisions to compliance dates, must go through a full and proper administrative process, including public notice, a public hearing, and an opportunity to comment, and must be supported by a valid rationale for the change, including reckoning with its environmental and other costs.

CAA section 307(d)(7)(B), the first provision cited by TTMA, is not available to stay the trailer standards pending reconsideration. Section 307(d)(7)(B) authorizes the effectiveness of a rule to be stayed by the Administrator or the court for a period of three months and only pending an administrative reconsideration proceeding that is *mandated* by the statute, not when the agency voluntarily initiates a

³ For example, EPA’s Notice of Intention To Reconsider the Final Determination of the Mid-Term Evaluation of Greenhouse Gas Emissions Standards for Model Year 2022–2025 Light Duty Vehicles was published without opportunity for public comment on March 22, 2017, with a corresponding announcement from President Trump at an event with automakers on the same day, following requests just weeks prior from the Alliance of Automobile Manufacturers and Global Automakers to do just that. Similarly, EPA notified landfill industry groups in a non-public letter of the agency’s intent to stay New Source Performance Standards and Emission Guidelines for municipal solid waste landfills on May 5, 2017. The letter did not become public until media reports on May 19, 2017, just days before Administrator Pruitt signed the stay on May 22 without notice or opportunity for public comment. Likewise, the public was notified of EPA’s intent to stay New Source Performance Standards for oil and gas sector methane emissions not via the publication of a notice in the Federal Register in accordance with law, but when the media reported on a letter that Administrator Pruitt sent to industry groups on April 18, 2017 to provide industry with advance notice that they would not have to comply with the standards. The stay was issued as a final rule without notice and comment on June 5, 2017.

⁴ *Verizon v. FCC*, 740 F.3d 623, 632 (D.C. Cir. 2014).

reconsideration proceeding.⁵ To trigger mandatory reconsideration, the petitioner must demonstrate that it was “impracticable to raise” an objection to the rule within the period for public comment or that the grounds for such objection arose after the period for public comment “but within the time specified for judicial review” and that the objection is “of central relevance” to the outcome of the rule.⁶

TTMA has failed to demonstrate these two requirements. First, TTMA does not allege that it was impracticable to raise an objection to the trailer standards or, indeed, to any part of the rule itself. Nor could it credibly do so. The issues it raises in its petition related to EPA’s authority to regulate trailers and to the substantive provisions of the rule were the subject of extensive comment during the rulemaking, as noted in our discussion below. TTMA also fails the central relevance test. TTMA claims that certain directives of Executive Order 13783, issued March 28, 2017,⁷ constitute centrally-relevant, new information. TTMA relies on two provisions of the order: Section 3, requiring that regulations arising from President Obama’s Climate Action Plan be “suspend[ed], revise[d], or rescind[ed] . . . as appropriate and consistent with law,” and Section 5, instructing agencies to withdraw various reports related to the social cost of carbon (SC-CO₂) and requiring that when monetizing the value of GHG reductions from regulations, such estimates be consistent with OMB Circular A-4.⁸ Neither of these directives of EO 13783 constitute an objection to the rule that section 307(d)(7)(B) contemplates as a valid basis for mandating reconsideration.

Nor is section 705 of the APA an available authority for staying the trailer standards. Section 705 authorizes stays “pending judicial review.” The legislative history of section 705 makes clear that Congress intended to “afford parties an adequate judicial remedy,”⁹ and to “provide intermediate judicial relief ... in order to make judicial review effective.”¹⁰ A stay pursuant to section 705 “plainly must be tied to the underlying pending litigation [and not administrative reconsideration] when the APA ... is the authority under which the stay is granted.”¹¹ TTMA asserts that Section 705 allows EPA to stay the trailer standards because a lawsuit challenging the Phase 2 standards, *Truck Trailer Manufacturers Association v. EPA*, No. 16-1430, is pending in the U.S. Court of Appeals for the D.C. Circuit. But TTMA makes clear in both petitions filed with the agencies that the litigation over the standards is not the driving factor behind its request for a stay. TTMA’s April 3 letter, which does not cite section 705 at all, requests a stay, not *pending* judicial review, but rather “to resolve” its petition for review of the

⁵ *Clean Air Council v. Pruitt*, 2017 U.S. App LEXIS 11803, at *15 (D.C. Cir. July 3, 2017).

⁶ 42 U.S.C. § 7607(d)(7)(B).

⁷ Exec. Order No. 13783, §§ 3, 5, 82 Fed. Reg. 16093. TTMA’s petition refers to “Executive Order 13777 on Promoting Energy Independence and Economic Growth.” The Executive Order issued on March 28 and titled “Presidential Executive Order on Promoting Energy Independence and Economic Growth” is Executive Order 13783.

⁸ TTMA’s claims stemming from the treatment of the SC-CO₂ are misplaced. The rule’s benefits vastly exceed the rule’s costs, regardless of whether the SC-CO₂ is accounted for at all, and therefore the issue raised by TTMA cannot be of central relevance to the outcome of the rule. For similar reasons, valuation of the SC-CO₂ cannot justify a stay under APA section 705, even if that provision were applicable here, given that it has no effect on the outcome of the rulemaking.

⁹ H. Rept. No.1980, 79th Cong., 2d Sess. (1946).

¹⁰ Sen. Rept. No. 752 at 187, 79th Cong., 2d Sess. (1946).

¹¹ *Sierra Club v. Jackson*, 833 F. Supp. 2d 11, 33 (D.D.C. 2012).

standards in the D.C. Circuit, clearly indicating a desire to avoid review by the court, not facilitate it.¹² TTMA's June 26 petition likewise requests administrative reconsideration of the standards; the request for a stay under section 705 is a clear attempt to pigeonhole the request into an inapplicable statutory authority. TTMA's request for a stay is clearly so that the *agency* can reconsider the trailer standards, not to provide relief while the D.C. Circuit proceeds with its review. This is an impermissible invocation of section 705.

TTMA concedes that, to warrant a stay under section 705, it must meet the four-part test courts use to evaluate requests for interim injunctive relief:¹³ (1) likelihood of success on the merits; (2) likelihood of irreparable harm absent a stay; (3) the prospect that others will be harmed if a stay is granted; and (4) the public interest in granting the stay. Even if section 705 were a valid authority for staying the trailer standards, TTMA fails this four-part test. None of these factors weigh in favor of staying the trailer standards: EPA has clear authority to regulate trailers under the CAA; the promulgated standards are cost-effective, well-reasoned, and in no way arbitrary and capricious; TTMA has not shown that its members will be irreparably harmed if a stay is not granted; and the public interest clearly favors the standards remaining in effect.

EPA Has Clear Authority under the Clean Air Act to Set Trailer Standards.

EPA's authority to adopt trailer standards rests on firm legal footing, reflects a reasonable interpretation of the relevant Clean Air Act provisions, and is consistent with the agency's past regulatory practice. EPA correctly determined the combined tractor-trailer constitutes a "new motor vehicle" within the meaning of section 202(a) of the CAA and has permissibly established standards for trailers on that basis.

Section 202(a)(1) of the CAA directs the Administrator to:

by regulation prescribe . . . standards applicable to the emission of any air pollutant from any class or classes of new motor vehicles or new motor vehicle engines, which in his judgment cause, or contribute to, air pollution which may reasonably be anticipated to endanger public health or welfare.¹⁴

The CAA further defines "motor vehicle" to mean "any self-propelled vehicle designed for transporting persons or property on a street or highway."¹⁵ EPA correctly explained that a combined tractor-trailer meets the statutory definition for motor vehicle, noting "Class 7/8 heavy-duty vehicles are composed of three major components:—The engine, the cab-chassis (i.e. the tractor), and the trailer," and "[c]onnected together, a tractor and trailer constitute 'a self-propelled vehicle designed for transporting . . . property on a street or highway,' and thus meet the definition of 'motor vehicle' under Section 216(2) of the CAA."¹⁶

¹² Apr. 3 Letter, p. 1.

¹³ TTMA Petition, p. 6.

¹⁴ 42 U.S.C. § 7521(a)(1).

¹⁵ 42 U.S.C. § 7550(2).

¹⁶ 80 Fed. Reg. 40170.

The statutory definition of “motor vehicle” in section 216 expressly defines that term in light of the vehicle’s intended use: “transporting persons or property on a road or highway.” EPA has correctly interpreted “motor vehicle” to encompass all of the components of Class 7 and 8 tractor-trailers (including the trailer), which are needed to accomplish that objective. In particular, Class 7 and 8 tractor-trailers are designed and used to transport large quantities of goods. To perform this task, the vehicle must have three components: an engine, a tractor, and a trailer. These three components are inextricably linked; no one part can successfully transport goods without the other two. And the trailers addressed in the Phase 2 standards are designed and engineered to operate in tandem with tractors. The height of the tractor is designed to correspond to the height of the trailer, achieving optimal aerodynamic performance and minimal air-resistance only when the two are coordinated.¹⁷ Moreover, as the primary load-carrying device, trailers account for a substantial percentage of the engine load and therefore contribute significantly to the vehicle’s emissions. Accordingly, the use of improved aerodynamic and tire technologies on the trailer will reduce the vehicle’s emissions.¹⁸ EPA’s interpretation of ‘motor vehicle’ as consisting of the engine, tractor, and trailer in the heavy-duty context is therefore a proper interpretation of the statute.¹⁹

Section 202(a)(1) requires that the agency adopt standards “applicable to . . . new motor vehicles” but does not describe whether one or more entities may be responsible for meeting these standards. In the absence of such a limitation, EPA properly determined that standards could apply to trailer manufacturers as well as tractor manufacturers, given that “[t]he trailer manufacturer sets the design specifications that affect the GHG emissions attributable to pulling the trailer.”²⁰

EPA correctly determined that trailer manufacturers fall within statutory definition of “manufacturer” in section 216,²¹ which is defined as:

¹⁷ 76 Fed. Reg. 57138-39 (Greenhouse Gas Emissions Standards and Fuel Efficiency Standards for Medium- and Heavy-Duty Engines and Vehicles – Phase 1).

¹⁸ These technologies are highly cost-effective. See Memorandum, “Tractor-Trailer Cost per Ton Values,” EPA HQ OAR 2017 0827- 2210, p. 2 (even more cost effective than the GHG standards for light trucks).

¹⁹ The fact that the trailer does not itself “emit” does not exclude it from EPA’s regulatory authority. Section 202(a)(1) authorizes EPA to adopt standards “applicable to the emission of any air pollutant” from new motor vehicles and motor vehicle engines. This statutory grant of authority clearly encompasses standards like those EPA has previously adopted for vehicle attributes that effect emissions, including low-rolling-resistance tires, low-drag brakes, and more aerodynamic vehicle shapes. 75 Fed. Reg. 25374 (2010 Light Duty Vehicle Greenhouse Gas Emission Standards). EPA has likewise interpreted this authority to allow the agency to adopt compliance approaches that reflect upstream emissions. See *id.* See also Response to Comments (“RTC”), p. 30 (“[Section 202(a)] does not directly address what the “standards applicable to” the emissions must be, or how those standards are to be measured. It does not specify how or what mechanisms EPA may reasonably use in applying a standard to vehicle emissions. This leaves EPA with discretion to develop both elements of the standards and the means of measuring compliance with them.”).

²⁰ EPA, Legal Memorandum Discussing Issues Pertaining to Trailers, Glider Vehicles, and Glider Kits under the Clean Air Act (“Legal Memorandum”), p. 5.

²¹ See, e.g., 42 U.S.C. § 7521(b)(1)(B)(i), § 7521(b)(4), § 7521(m).

any person engaged in the manufacturing or assembling of new motor vehicles, new motor vehicle engines, new nonroad vehicles or new nonroad engines, or importing such vehicles or engines for resale, or who acts for and is under the control of any such person in connection with the distribution of new motor vehicles, new motor vehicle engines, new nonroad vehicles or new nonroad engines.²²

This definition is capacious and in no way suggests a new motor vehicle must have a single manufacturer. EPA determined that “[i]t is reasonable to view the trailer manufacturer as ‘engaged in’ (section 216 (1)) the manufacturing or assembling of the tractor-trailer,”²³ and that its responsibility under section 202 of the CAA to “prescribe (and from time to time revise) . . . standards applicable to the emission of any air pollutant from any class or classes of new motor vehicles . . . which in his judgment cause, or contribute to, air pollution which may reasonably be anticipated to endanger public health or welfare” includes the authority to regulate the manufacturer of the trailer component of the combined tractor-trailer.²⁴ Moreover, as EPA notes, a single-manufacturer interpretation would result in an unworkable system where entities without design or manufacturing authority would face compliance obligations.²⁵ Accordingly, the agency’s determination to set standards applicable to trailer manufacturers—given that the trailer is a major contributor to the emissions of the heavy-duty vehicle—is plainly correct.

The Promulgated Standards Are Cost Effective, Well-Reasoned, and in No Way Arbitrary and Capricious.

DriveCycle. TTMA maintains that EPA arbitrarily estimated the performance of aerodynamic technologies, and so the trailer standards are fundamentally flawed.²⁶ Specifically, TTMA maintains that the duty cycles used by the agencies to estimate aerodynamic performance, and to establish the box trailer standards’ stringency, arbitrarily overestimate how much box trailers are used at speeds of 65 mph or greater.

The agencies addressed this issue carefully and showed that TTMA is mistaken. The agencies proposed, and ultimately adopted, estimates reflecting long- and short-haul box trailer drive cycles documented in three extensive studies (MOVES, California Riverside, and Oak Ridge). In rulemaking comments, TTMA member company Utility Trailer Manufacturing (UTM)²⁷ submitted limited operating data from three trailer fleets purportedly showing that, unlike the agencies’ data, trailers operated at speeds for which aerodynamic technologies provided minimal benefit. In fact, these data were essentially equivalent: the

²² 42 U.S.C. § 7550(1) (CAA § 216(1)).

²³ EPA, Legal Memorandum, p. 5.

²⁴ 42 U.S.C. § 7521(a)(1).

²⁵ EPA, Legal Memorandum, p. 6.

²⁶ Pet. pp.9-10. This argument has no applicability for those trailer standards which are not predicated substantially on performance of aerodynamic technologies, and so does not apply to the standards for non-box, non-aero, or partial aero trailers. See, e.g., 81 Fed. Reg. 73648.

²⁷ See Pet. n. 23.

fleets in the UTM data set had a distance-based weighted average of 58 mph, and the fleet data used by the agencies had a distance-based weighted average speed of 62 mph.²⁸ Given this corroborative information, the far more extensive amount of data in the agencies' studies, and the further indication that the agencies' data might be overestimating the amount of distance-based travel at speeds lower than 30 mph and so underestimating aerodynamic technology real world performance, the agencies reasonably continued to use the same data cycles as proposed.²⁹

TTMA now maintains that the agencies' data does not support that trailers travel substantial distances at speeds exceeding 65 mph. However, the agencies' estimates were for distances traveled at 65 mph cruising speed, not speeds exceeding 65 mph.³⁰ Moreover, "aerodynamic devices are nearly as effective at 55 mph compared to 65 mph (about a 20% difference)" and the UTM data showed more operation in the 55-60 mph range than the agencies' data. Finally, the UTM data sets showed very similar amounts of overall operation at speeds of 55 mph and higher.³¹ The agencies thus reasonably viewed the data sets as consistent and predicting similar benefits: "[w]hile our proposed drive cycle weightings place a somewhat larger percentage of operation at 65-mph than does the more limited [UTM] analysis, trailers traveling at speeds of 55 mph will still experience a significant benefit with aerodynamic improvements regardless of the exact weighting."³² And, not to lose sight of the forest for the trees, "[t]he results indicate that the fleets are not traveling a majority of their miles at speeds that would have minimal benefit from the technologies that are the basis of the Phase 2 trailer program; the data generally indicate the reverse."³³

Weight of aerodynamic devices. TTMA maintains that the agencies "failed to account fully for the additional weight of aerodynamic devices, which increase fuel consumption, resulting in more trips, more emissions, and more accidents."³⁴ However, TTMA is incorrect: this assertion was fully addressed in the rulemaking.

²⁸ Memorandum, "Comparison of GEM Drive Cycle Weightings and Fleet Data Provided by Utility Trailer Manufacturing Co. in Public Comments," p. 2 (EPA HQ OAR 2017 0827 2219) ("Drive Cycle Weighting Memo"). Petitioner asserts that the data sets are not equivalent but ignores this comparison. Pet. n. 23.

²⁹ RTC, pp. 1030-1031.

³⁰ RIA, p. 2-219; RTC p. 993.

³¹ Drive Cycle Weighting Memo, p. 3 and Figures 2 and 3.

³² RTC, p. 1031, citing RIA Fig. 2-56 and 2-57 at RIA pp. 2-219 and 2-220.

³³ Drive Cycle Weighting Memo, p. 4. TTMA further maintains that of the agencies' data, only the MOVES database shows operation at speeds 60 mph or greater. In fact, the Oak Ridge data shows that 78% of the miles traveled were at speeds greater than 60 mph. RTC, p. 1030. The UTM database likewise shows large percentages (between 46% and 70%) of miles traveled at speeds between 60 mph and 65 mph. Drive Cycle Weighting Memo, p. 2, Table 1.

³⁴ Pet., p. 11.

With respect to emissions, the agencies demonstrated that the extra weight of aerodynamic devices would have minimal effect on emissions, and that there would be CO₂ emission improvements for all types of box trailers³⁵ after taking the weight of aerodynamic devices into account.³⁶

NHTSA (the expert safety agency) likewise found that under the range of compliance alternatives available under the rule,

the potential positive safety implications of weight reduction efforts could partially or fully offset safety concerns from added weight of aerodynamic devices. In fact, we believe that the Phase 2 trailer program could produce a safety benefit in the long run due to the potentially greater amount of cargo that could be carried on each truck as a result of trailer weight reduction.³⁷

With respect to the issue of “weighting out” — TTMA’s assertion that the weight of aerodynamic devices will cause the trailer to exceed applicable weight limits — the agencies indicated that the rule’s requirements for box trailers are expressed as performance standards, and so do not mandate use of any particular aerodynamic device, or any aerodynamic controls at all. Other available compliance pathways include more aerodynamic trailer design, low rolling resistance tires, better maintenance of tire pressure, and using lightweight materials in lieu of aerodynamic devices. The rule in fact provides a number of flexibilities that make light weighting a readily available alternative compliance mechanism, including a menu of light weighting options with predetermined compliance values to facilitate compliance and off-cycle credits for light weighting technologies not on that menu.³⁸

TTMA is incorrect in deeming unreasonable these alternative compliance pathways and use of lighter weight materials in particular. Their assertion that customers would already have chosen this approach if commercially desirable is misplaced, given that the record demonstrates convincingly that there are many available, highly cost effective technologies already available that are under-utilized in the current trailer fleet.³⁹ Moreover, much of TTMA’s argument rests on the mistaken premise that lighter weight materials would have to be used in conjunction with the full panoply of aerodynamic devices, when light weighting substitutes for aerodynamic improvements.⁴⁰ TTMA also ignores that the standards pay for themselves, and then some, in the form of fuel savings. Even using inflated industry cost estimates, the box trailer standards (when fully phased-in after 2027 — i.e. at the time of maximum expense) are estimated to have a 2.5 year payback period (which accounts for cost of low rolling resistance tires and

³⁵ Again, this part of the Petition can have no applicability to the non-box, non-aero, and partial aero trailer standards because those standards are not predicated on use of aerodynamic technologies, or only on their minimal use.

³⁶ Memorandum, “Impact of Additional Weight Due to Trailer Aerodynamics”, EPA HQ OAR 2017 0827 2219, p. 3.

³⁷ RTC, p. 1019.

³⁸ RTC, p. 1019.

³⁹ RTC, pp. 965-966.

⁴⁰ Pet., p. 11; RTC, pp. 972, 1019.

tire inflation systems as well as aerodynamic improvements), after which the on-going fuel savings are greater than the rule's compliance costs.⁴¹ In addition, the argument ignores the substantial and highly cost-effective emission control benefits accruing from the trailer standards.⁴²

TTMA's Claims of Irreparable Harm Appear to Be Exaggerated.

TTMA's claims of irreparable harm are undocumented and appear exaggerated. The model year 2018 standards for long-box trailers can be met with off-the-shelf aerodynamic and tire technologies, at a stringency already needed to meet California standards or to receive SmartWay verification.⁴³ EPA estimated that the modest cost of these improvements would average \$716, approximately 3.5% increase in the cost of a new long box trailer, with a 2 -year payback period.⁴⁴ Other trailer types (short box trailers, and the various non-box or non-aero trailers) have model year 2018 standards which are not premised on any aerodynamic improvements, and are estimated to cost even less.⁴⁵ Nor does TTMA address the many flexibilities in the rule to facilitate compliance, among them pre-testing of aerodynamic devices by the device manufacturer rather than the trailer manufacturer, a compliance equation rather than GEM simulation, design standards (no testing of any type) for regulated non-box trailers, and outright exemption of most non-box trailers.⁴⁶ All of these unacknowledged flexibilities militate against TTMA's assertions of irreparable harm.

The Trailer Standards Are Already Proven Cost Effective.

TTMA claims that if the trailer standards are not stayed, its members will suffer irreparable harm in the form of loss of business, market share, goodwill, and compliance costs. Data from EPA's SmartWay program and the success of the trailer standards in California's 2010 heavy-duty vehicle emissions standards directly discredit these unsubstantiated claims.

The EPA SmartWay program has included a formal verification program for technologies that are commercially available and that have validated fuel savings performance levels.⁴⁷ EPA's verification process, which includes options for track testing, wind tunnel testing, coastdown testing, and computational fluid dynamics (CFD) testing, provides a third-party estimate of fuel savings associated

⁴¹ RTC, pp. 1015-1016.

⁴² Memorandum, "Tractor-Trailer Cost per Ton Values", EPA HQ OAR 2017 0827- 2210, p. 2 (even more cost effective than the GHG standards for light trucks).

⁴³ 81 Fed. Reg. 76349/1.

⁴⁴ RIA, p. 2-254 and 81 Fed. Reg. 73663/1.

⁴⁵ 81 Fed. Reg. 73649/2 and RIA p. 2-254.

⁴⁶ See, e.g., 81 Fed. Reg. 73646, 665-671. The rule excludes outright those trailers for which aerodynamic improvements will be minimal due to predominant operation at low speed or otherwise inappropriate drivecycles (i.e. where aerodynamic technologies will not be especially beneficial) — namely all non-box trailers (except flatbed, tank, and container— this still excludes 50% of non-box trailers). The rule also already accommodates box trailers for which aerodynamic improvements would not be cost effective. Thus, there are separate standards for 'non-aero' and 'partial-aero' box vans which either have design standards for low-rolling resistance tires and tire inflation devices only, or (for partial aero trailers) have standards predicated on use of a single aerodynamic device.

⁴⁷ <https://www.epa.gov/sites/production/files/2016-03/documents/420b15021.pdf>.

with technology implementation. Aerodynamic technologies and low rolling resistance tires have been in the EPA SmartWay verification program since 2009,⁴⁸ with a growing list of manufacturers providing verified technologies applicable for trailers (currently at 98 aerodynamic technologies from 12 manufacturers,⁴⁹ and 752 low rolling resistance tire options (new and retread)⁵⁰).

SmartWay trailers (53-foot dry van or refrigerated trailers in long-haul applications) with one or more aerodynamic devices and low rolling resistance tires are estimated to save 1,000 gallons of diesel per year (6% or greater in fuel savings).⁵¹ At today's average national diesel price (\$2.472⁵²), fuel savings would be approximately \$2,472. SmartWay *Elite* trailers (53-foot dry van or refrigerated trailers in long-haul applications) with two or more aerodynamic devices and low rolling resistance tires are estimated to save 1,700 gallons of diesel per year (10% or greater in fuel savings).⁵³ At today's average national diesel price (\$2.472⁵⁴), fuel savings would be approximately \$4,202.

Implemented in 2010, the California Air Resources Board's GHG tractor-trailer rule required the use of aerodynamic and/or low rolling resistance tires for 53-foot box trailers operating in California. Anticipated incremental cost for the SmartWay-certified trailers was \$2,900, with expected annual fuel savings of \$1,300 to \$3,300.⁵⁵ And fleets outside of California are also pushing for more efficient trailers. Adoption rates for aerodynamic technologies on trailers has been growing, with one study estimating that these devices are installed on as many as 25% of all trailers on the road.⁵⁶ Phase 2-compliant trailers have been in operation at Mesilla Valley Transportation, headquartered in New Mexico, and Nussbaum Transportation, headquartered in Illinois, for several years. Fleet executives have reported that "the equipment is highly effective at saving fuel."⁵⁷ Pan American Express, a company based in Laredo, TX, specifies the use of low rolling resistance tires and aerodynamics on its trailer (and tractor) fleet.⁵⁸ In North Carolina, Cargo Transporters has successfully integrated SmartWay certified trailers and tractors into its operations for years.⁵⁹

Public Interest Considerations Weigh in Favor of Keeping the Trailer Standards in Place.

TTMA asserts that no other parties will be harmed if the trailer standards are stayed, and that a stay is in the public interest.⁶⁰ According to TTMA, no harm can accrue to others impacted by the standards

⁴⁸ <https://www.epa.gov/sites/production/files/2015-10/documents/recovery-act-national-clean-diesel-rfa.pdf>.

⁴⁹ <https://www.epa.gov/verified-diesel-tech/smartway-verified-list-aerodynamic-devices>.

⁵⁰ <https://www.epa.gov/verified-diesel-tech/low-rolling-resistance-lrr-new-and-retread-tires>.

⁵¹ <https://www.epa.gov/sites/production/files/2016-03/documents/420f15009.pdf>.

⁵² <https://www.eia.gov/petroleum/gasdiesel/>.

⁵³ <https://www.epa.gov/sites/production/files/2016-03/documents/420f15009.pdf>.

⁵⁴ <https://www.eia.gov/petroleum/gasdiesel/>.

⁵⁵ <https://www.arb.ca.gov/msprog/moyer/voucher/presentations/trucktrailerreg.pdf>.

⁵⁶ http://nacfe.org/wp-content/uploads/2014/03/ICCT_trailer-tech-costs_20140218.pdf.

⁵⁷ <http://www.tida.org/news/239517/Trailers-Meeting-Phase-2-Fuel-GHG-Regs-Already-Out-There.htm>.

⁵⁸ <http://www.fleetequipmentmag.com/pan-american-express-trucks-trailers-operational-practices/>.

⁵⁹ http://www.hickoryrecord.com/news/still-trucking-cargo-transporters-inc-to-add-jobs-invest-million/article_217d97da-5ba9-11e3-938e-0019bb30f31a.html.

⁶⁰ Pet., p. 14.

because the standards “would achieve little if any benefit to global climate change” as trailer manufacturers already install the required technologies when they are likely to improve fuel economy and reduce GHG emissions.⁶¹ TTMA provides no data to substantiate this claim. Voluntary, piecemeal installation of emissions reducing technologies by some manufacturers simply cannot match the climate benefits of uniform federal standards. The agencies have clearly demonstrated that the trailer standards will benefit the public: the fully phased-in trailer standards are projected to achieve up to 9 percent lower CO₂ emissions and fuel consumption compared to an average model year 2017 trailer.⁶²

The public also has a strong interest in the consumer benefits that standards are projected to deliver through the more efficient transportation of goods. The Consumer Federation of America found that rigorous fuel economy and greenhouse gas standards—of which trailer standards are an important part—could save American households \$250 annually in the near term and \$400 annually by 2035.⁶³

Conclusion.

EPA may not stay the trailer standards without statutory authority, and no such authority is conferred by either of the provisions cited by TTMA, nor does it exist elsewhere. EPA may not act on TTMA’s petitions without allowing public participation, a hallmark of lawful administrative procedure, and critical to informed decision-making and regulatory stability on these issues of vital importance to our nation. Any revision to the rule, including revising compliance dates, must go through notice and comment and conform to the requirements of the CAA. We call on EPA and NHTSA to maintain and enforce the vital public health and environmental safeguards contained in the Phase 2 standards.

Respectfully submitted,

Alice Henderson
Attorney
Environmental Defense Fund

⁶¹ Pet., p. 13.

⁶² Regulatory Announcement, *EPA and NHTSA Adopt Standards to Reduce Greenhouse Gas Emissions and Improve Fuel Efficiency of Medium- and Heavy-Duty Vehicles for Model Year 2018 and Beyond*, p. 3, available at <https://nepis.epa.gov/Exe/ZyPDF.cgi/P100P7NL.PDF?Dockey=P100P7NL.PDF>.

⁶³ <http://www.consumerfed.org/pdfs/Paying-the-Freight.pdf>.

July 11, 2017

Transmitted by electronic mail

E. Scott Pruitt, Administrator
U.S. Environmental Protection Agency
William Jefferson Clinton Building
1200 Pennsylvania Avenue, N.W.
Mail Code: 1101A
Washington, D.C. 20460

RE: The Ohio Environmental Council Joining Administrative Petition to Stay, Pending Judicial Review, the *Extension of Deadline for Promulgating Designations for the 2015 Ozone National Ambient Air Quality Standards*, 82 Fed. Reg. 29,249 (June 28, 2017).

Dear Mr. Pruitt:

On July 5, 2017, American Lung Association, Clean Air Council, National Parks Conservation Association, Natural Resources Defense Council, Physicians for Social Responsibility, Sierra Club, and West Harlem Environmental Action petitioned you to stay, pending judicial review, the effectiveness of the final action taken by EPA extending the deadline for promulgating initial area designations for the 2015 ozone National Ambient Air Quality Standards (“designations delay”), first announced in letters to state governors dated June 6, 2017, e.g., Letter from Scott Pruitt, Adm’r, EPA to Doug Ducey, Gov. of Ariz., at 1, *available at*:

https://www.epa.gov/sites/production/files/2017-06/documents/az_ducey_6-6-17.pdf, and late published at 82 Fed. Reg. 29,246 (June 28, 2017), entitled *Extension of Deadline for Promulgating Designations for the 2015 Ozone National Ambient Air Quality Standards*. On July 10, 2017, the American Public Health Association, American Thoracic Society, and Environmental Defense Fund wrote you indicating their intention to join the stay petition.

The Ohio Environmental Council hereby also joins the July 5, 2017 petition. As explained in the petition, EPA’s decision to delay the ozone designations failed to

comply with statutory requirements and was capricious and irrational. Your designations delay action must be immediately stayed.

DATED: July 11, 2017

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Ann Brewster Weeks".

Ann Brewster Weeks
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Counsel to:
The Ohio Environmental Council

Cc: Trent Dougherty, The OEC
Kevin Minoli, U.S. EPA
Denise Scott, U.S. EPA

Administrator Scott Pruitt
Environmental Protection Agency
1200 Pennsylvania Ave., N.W.
Washington, DC 20460

Re: Request to Grant Clean Air Act “Good Neighbor” Petitions from Connecticut, Delaware, and Maryland (Docket ID Nos. EPA-HQ-OAR-2016-0347, EPA-HQ-OAR-2016-0402, EPA-HQ-OAR-2016-0509, EPA-HQ-OAR-2016-0690, and EPA-HQ-OAR-2016-0691).

Dear Administrator Pruitt:

The American Lung Association’s 2017 State of the Air report found that nearly 4 in 10 Americans live in communities with dangerous air pollution levels. The burden on human health from this air pollution is serious and far-reaching. Every year in the U.S., air pollution causes thousands of premature deaths, heart attacks, asthma attacks, and missed school and work days. Those afflicted include the most vulnerable in our nation: the elderly, children, those who work outdoors, and people living in poverty. In addition, some communities of color bear a disproportionate burden from air pollution. Families from rural Shelocta to urban Pittsburgh in Pennsylvania, and communities extending from Columbus, Ohio to Atlanta, Georgia, are breathing air that is unsafe. In the face of this evidence, commencing an unprecedented attack on clean air safeguards (including some fully-implemented clean air measures) that will only worsen this serious health burden for all Americans moves the Agency further away from achieving its Congressional purpose to protect and enhance the quality of the Nation’s air resources so as to promote the health and welfare and the productive capacity of its population. At the same time, you are failing to respond to states that have petitioned you to carry out your duty under our nation’s clean air laws to protect millions from pollution originating from large industrial sources in upwind jurisdictions. We urge you to carry out your duties under our nation’s clean air laws.

On behalf of the undersigned public health, conservation, and environmental organizations, and our millions of members and supporters, we strongly urge you to carry out your responsibility under the statutory Good Neighbor provisions of the Clean Air Act to protect communities and families in Connecticut, Delaware, and Maryland, and millions more in communities across the eastern United States living downwind from smokestack pollution significantly contributing to dangerous ground-level ozone (or smog) pollution levels. Last year, the States of Connecticut, Delaware, and Maryland all submitted petitions under section 126 of the Clean Air Act asking EPA to find that specified power plants outside of their respective borders were violating the Good Neighbor protections of the Clean Air Act because their smokestack pollution was contributing to unhealthy ozone levels within their respective states.

Remarkably, each and every one of the power plants identified by Maryland’s November 16, 2016 petition and by Delaware’s August 8, 2016 and November 10, 2016 petitions—plants located in Indiana, Kentucky, Ohio, Pennsylvania, and West Virginia—has modern pollution controls *installed* that

the owners are not fully *operating* to reduce dangerous smog-forming pollution. In addition, the Pennsylvania power plant identified by Connecticut's June 1, 2016 petition and by Delaware's July 7, 2016 petition is also capable of dramatically reducing its ozone-causing emissions this upcoming ozone season. In other words, all of the identified power plants are able to immediately provide much-needed pollution reductions for surrounding communities and downwind states struggling to clean up their air. To protect the health of millions of Americans, it is urgent that you end your delay and grant these petitions by the May 1st start of the summer ozone season.

In its petition, Maryland asked EPA to require the affected power plants to effectively run their *already-installed* pollution controls every day during the ozone season, which extends from May 1 through September 30. Maryland's petition included rigorous air quality modeling showing that its proposed solution would not only help Maryland meet the national, health-based, air quality standards for ozone, but would also help the Philadelphia and Washington, D.C. areas to make progress towards achieving those public health standards. Similarly, Connecticut's and Delaware's petitions showed significant air quality benefits in their respective states stemming from solutions that are immediately available at upwind power plants. These proposed solutions would also provide critical air quality benefits to the communities surrounding the affected power plants in Indiana, Kentucky, Ohio, Pennsylvania, and West Virginia, as well as other downwind states, including New Jersey and New York, and even Maine, Massachusetts, and Rhode Island. You can get additional information, review Maryland's petition, and see its list and descriptions of the power plants failing to operate their pollution controls [here](#). In addition, you can find additional information about the Connecticut petition [here](#).

Given the imminent onset of ozone season on May 1, 2017 and the fact that you have had several months to review and act upon these petitions, we request that you immediately grant the petitions as a necessary part of fulfilling your obligations to ensure that communities and families in all of the affected states have air that is safe to breathe. Taking the common-sense and easily-implemented step of requiring the specified power plants to turn on their existing pollution controls and run them effectively every day during ozone season will help keep the millions of people in these communities from being subjected to dangerous smog levels.

We also urge you to stop the unprecedented attack on vital clean air safeguards that are protecting these same communities and millions of Americans nationwide. Your assault on clean air safeguards is a clear and present danger to the health and well-being of our communities, our families, and our children.

Thank you for your prompt attention to these urgent matters.

Sincerely,

William C. Janeway
Executive Director
The Adirondack Council

Leah Kelly
Attorney
Environmental Integrity Project

Ann B. Weeks
Legal Director
Clean Air Task Force

Tamara Toles O'Laughlin
Executive Director
Maryland Environmental Health Network

Frank O'Donnell
President
Clean Air Watch

Molly Rauch, MPH
Public Health Policy Director
Moms Clean Air Force

Seth Johnson
Attorney
Earthjustice

Joshua Berman
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Sierra Club

Peter M. Iwanowicz
Executive Director
Environmental Advocates of New York

Dr. Adrienne L. Hollis, Esq.
Director of Federal Policy
WE ACT for Environmental Justice

Graham McCahan
Senior Attorney
Environmental Defense Fund

Cc: Sarah Dunham, Acting Administrator, EPA Office of Air and Radiation
Gobeail McKinley, EPA (for Docket ID Nos. EPA-HQ-OAR-2016-0347, EPA-HQ-OAR-2016-0402,
and EPA-HQ-OAR-2016-0509)
Benjamin Gibson, EPA (for Docket ID Nos. EPA-HQ-OAR-2016-0690 and EPA-HQ-OAR-2016-
0691)



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June 19, 2017

Hon. Scott Pruitt
Administrator
United States Environmental Protection Agency
Mail Code 1101A
1200 Pennsylvania Avenue, N.W.
Washington, D.C. 20560

By U.S. mail and email

Dear Administrator Pruitt,

Thank you very much indeed for your productive and cooperative approach in soliciting the views of state officials on defining the “waters of the United States” in connection with your responsibilities under the Clean Water Act. I have joined with many of my fellow Attorneys General in a multistate response to your invitation, and I supplement that letter here by offering a few additional observations and points of emphasis.

In the interest of brevity, I incorporate by reference the entire critique of the 2015 WOTUS Rule spelled out in the Complaint that I filed with the Attorneys General for Michigan and Tennessee on June 29, 2015 -- the very day that final Rule was published -- and in the Motion for Preliminary Injunction that we filed in that case styled *State of Ohio, et al. v. United States Army Corps of Engineers, et al.*, case number 2:15-cv-02467 (S.D. Ohio), along with the related arguments advanced by roughly thirty States in the Sixth Circuit in connection with our Ohio, Michigan, and Tennessee petition (15-3799) and related cases there, *cf. In re: EPA and DOD Final Rule*, 803 F.3d 804 (nationwide stay of Rule pending judicial review because petitioners have demonstrated substantial possibility of success on the merits).

As I noted to your predecessor in commenting on an earlier proposed definition (and I incorporate here, too, that comment letter of November 13, 2014), the tortured history of federal regulatory actions in this area underscores the need for regulatory reform that would advance clear, constitutionally appropriate rules consistent with the language of the Clean Water Act itself that properly could guide the conduct both of government regulators and private property owners. Unfortunately, both the proposed rule on which I was then commenting and the 2015 WOTUS Rule would have extended federal authority well beyond the bounds contemplated by the Act and thereby further muddled the regulatory waters.

In contrast with the 2015 attempted land grab, any appropriate administrative definition of federal reach under the Clean Water Act must be informed by and respect that Act’s explicit terms. The Clean Water Act confers federal regulatory jurisdiction over “navigable” waters, which the Act defines as “waters of the United States, including the territorial seas.” *See* 33 U.S.C. §§ 1251, 1344, 1362(7). At the same time, “Congress chose to ‘recognize, preserve, and protect the primary responsibilities and rights of States ... to plan the development and use ... of

land and water resources’.” *Solid Waste Ag. of N. Cook Cnty. v. U.S. Army Corps of Engineers*, 531 U.S. 159, 174 (2001) (“*SWANCC*”) (quoting 33 U.S.C. §1251(b) and acknowledging “the States’ traditional and primary power over land and water use”).

Thus, “[t]he term ‘navigable’ has at least the import of showing us what Congress had in mind as its authority for enacting the CWA: its traditional jurisdiction over waters that were or had been navigable in fact or which could reasonably be so made.” *Id.* at 172; *see also Rapanos v. United States*, 547 U.S. 715, 778 (2006) (Kennedy, J., concurring) (a “central requirement” of the Act is that “the word ‘navigable’ in ‘navigable waters’ be given some importance”); *id.* at 779 (Kennedy, J., concurring) (“the word ‘navigable’ in the Act must be given some effect”); *cf. id.* at 731 (plurality) (Court has “emphasized” that the statutory “qualifier ‘navigable’”, while “broader than the traditional [interstate/navigable in fact] understanding” of the term, “is not devoid of significance”) (citing *SWANCC*).

Not incidentally, perhaps, the Act’s use of the term “navigable” comes within Title 33’s coverage of “Navigation and Navigable Waters.” *See, e.g.,* 33 U.S.C. § 1 (regarding regulation by the Secretary of the Army relating to “navigation of the navigable waters of the United States”); 33 U.S.C. § 26b (declaring a designated portion of the Calumet River to be “a nonnavigable stream within the meaning of the Constitution and laws of the United States”); 33 U.S.C. § 391 (regarding laws of the United States “made for the protection of persons or property engaged in commerce or navigation”). The Clean Water Act itself comes between chapters on the Ports and Waterways Safety Program, 33 U.S.C. §§ 1221 *et seq.*, and on Ocean Dumping, 33 U.S.C. §§ 1401 *et seq.*

The 2015 WOTUS Rule scorned the Supreme Court’s Clean Water Act understanding that “nonnavigable, isolated, intrastate waters” that do not “actually abut on a navigable waterway” do not come with the term “waters of the United States.” *SWANCC*, 531 U.S. at 171, 167. Instead, as Ohio has noted with Michigan and Tennessee and with other States, the 2015 Rule read “waters of the United States” so broadly that the agencies promulgating the Rule found it necessary explicitly to disclaim authority over “puddles” and certain swimming pools (those “constructed in dry land”): But for agency grace, they suggested, the Rule by its terms would extend even there. *See* 33 C.F.R. § 328.3(b)(4)(iii), (iv); *see also* 80 Fed. Reg. 37099 (finding it necessary to detail that “[a] puddle is commonly considered a very small, shallow, and highly transitory pool of water that forms on pavement or uplands during or immediately after a rainstorm or similar participation event”).

In breathtaking claims of power, the 2015 WOTUS Rule purported to cover arguable stream beds that usually carry no water at all, and even if not apparent to the naked eye (making them somewhat less “navigable” even than the excluded “puddles”). By defining “adjacent” to include even non-adjacent territories, the Rule purported categorically to reach wet spots as far as an arbitrary 1,500 feet from even “ephemeral” stream beds and other land features the Rule defined as “tributaries.” And it asserted potential coverage up to another arbitrary distance of more than three-quarters of a mile away. In short, the 2015 WOTUS Rule reached far beyond the federal jurisdiction that Congress envisioned and expressed in the Clean Water Act. In entering its stay of the Rule, the Sixth Circuit was rightly concerned about “the burden –

potentially visited nationwide on governmental bodies, state and federal, as well as private parties – and the impact on the public in general, implicated by the Rule’s effective redrawing of jurisdictional lines” *In re EPA*, 803 F.3d at 808; *but cf.* 80 Fed. Reg. 37102 (federal agencies asserting somehow that 2015 WOTUS Rule “does not have federalism implications”).

The WOTUS Rule as issued in 2015 only confirms me in the view expressed in my 2014 comment letter that the Supreme Court plurality in *Rapanos* advanced an understanding of the meaning of “waters of the United States” in keeping with the terms of the Clean Water Act that should guide the agencies in shaping an administrative definition. That definition should be reasonable and workable, and must be lawful under the Act: it needs to honor “the policy of cooperative federalism that informs the Clean Water Act and must attend the shared responsibility for safeguarding the nation’s waters.” *In re EPA*, 803 F.3d at 808. Very significantly, it seems to me, any such analysis must in Justice Kennedy’s words give “some importance” to the word “navigable” in the phrase “navigable waters” that the term “waters of the United States” assays to define. *See also Rapanos*, 547 U.S. at 760 (Kennedy, J., concurring) (“The statutory term to be interpreted and applied in the two instant cases is the term ‘navigable waters’”).

As my colleagues also underscore, the *Rapanos* plurality found that “waters of the United States” refers “to water ‘[a]s found in streams and bodies forming geographical features such as oceans, rivers, [and] lakes,’ or ‘the flowing or moving masses, as of waves or floods, making up such streams or bodies.’ ... On this definition, ‘the waters of the United States’ include only relatively permanent, standing or flowing bodies of water. The definition refers to water as found in ‘streams,’ ‘oceans,’ rivers,’ ‘lakes,’ and ‘bodies’ of water forming geologic features.’ ... All of these terms connote continuously present, fixed bodies of water, as opposed to ordinarily dry channels through which water occasionally or intermittently flows...” *Id.* at 732-33, *see also id.* at 739. Moreover, the plurality observed, wetlands may be situated actually adjacent to such waters “with a continuous surface connection” and in such a way that “there is no clear demarcation” between them, “making it difficult to determine where the ‘water’ ends and the ‘wetland’ begins,” *id.* at 742, and the plurality said the Act extends to such water features as well, *see id.* at 735 (citations omitted); *cf. id.* at 768 (Kennedy, J., concurring) (“at least some wetlands fall within the scope of the term ‘navigable waters’”).

It ought to be possible for the agencies, in setting out a definition to channel their federal administrative scope, to factor the Act’s concept of navigability -- presumably by *people*, not insects or waterfowl -- into this context involving relatively permanent standing or flowing bodies of water, forming geologic features, along with other relatively permanent water features having a continuous surface connection with such a navigable body of water. Congress’s use of the “qualifiers” “navigable” and “of the United States” both restrain the scope of federal jurisdiction under the Act, and the Supreme Court has not adjudicated the “precise extent” of those bounds (even while observing that past agency understandings of their dominion under the Act went too far). *Rapanos*, 547 U.S. at 731 (plurality); *see also id.* at 735 (plurality; citations omitted) (Court has “repeatedly described the ‘navigable waters’ covered by the Act as ‘open water’ and ‘open waters’”).

After so much confusion and litigation, the agencies should advance their own reasoned and legal interpretation further specifying what “navigable” means under the Act and how that term fits with the relatively permanent standing or flowing bodies of water that Justices have said help characterize it. Significantly, and as my colleagues also point out, the Act’s federal protection of “navigable waters” does not limit federal responsibilities only to “pollutant” release *initiated* in such waters: the Clean Water Act explicitly covers the introduction of pollutants into navigable waters *from* “point sources,” and “[t]he definitions thus conceive of ‘point sources’ and ‘navigable waters’ as separate and distinct categories.” *Id.* (citing 33 U.S.C. § 1362); *see also id.* at 743. That is, the discharge into navigable waters from (non-navigable) point sources is an appropriate object of federal concern. But someone putting fill dirt into a backyard rut in all likelihood does not meet that description, and the federal government should acknowledge that important distinction. *See id.* at 744 (plurality) (“‘dredged or fill material,’ which is typically deposited for the sole purpose of staying put, does not normally wash downstream, and thus does not normally constitute an ‘addition... to navigable waters’ when deposited [even] in upstream isolated wetlands”) (citing 33 U.S.C. §§ 1344(a), 1362(12)). And the agencies must carry out their important responsibilities while taking care not to eviscerate what the Supreme Court has called “the States’ traditional and primary power over land and water use.” *SWANCC*, 531 U.S. at 174; *see also Rapanos*, 547 U.S. at 738 (plurality) (“[r]egulation of land use ... is a quintessential state and local power”).

In addressing that hugely significant work under the terms of the governing statute, the President has directed the agencies to consider “interpreting the term ‘navigable waters,’ as defined in 33 U.S.C. 1362(7), in a manner consistent with the [plurality] opinion of Justice Scalia in *Rapanos*.” *Both* prongs of that guidance are significant: the *Rapanos* plurality provides useful insights into the kinds of “relatively permanent” “open waters” that can constitute “navigable waters” as to which federal jurisdiction obtains, and by not losing focus on interpreting the phrase “*navigable waters*” as defined by the Act to mean waters “of the United States,” the agencies should be well positioned to chart a sensible and constitutionally sound approach in keeping with the statutory mandate to “recognize, preserve, and protect the primary responsibilities and rights of States ... to plan the development and use ... of land and water resources.” *See* 33 U.S.C. § 1251(b); *see also, e.g.,* 33 U.S.C. § 1370 (except as “expressly provided,” law must not be construed in a way “impairing or in any manner affecting any right or jurisdiction of the States with respect to the waters ... of such States”).

Unlike some terms, perhaps, “navigable waters” has meaning that can be fleshed out, and I respectfully submit that undertaking that enterprise could be very productive in generating clear, comprehensible, and non-arbitrary jurisdictional understandings consistent with the law. Thank you, again, very much for your concern with and attention to this important matter.

Very respectfully yours,



Mike DeWine
Ohio Attorney General



July 10, 2017

Submitted via www.regulations.gov

Water Division
US Environmental Protection Agency, Region 6
1445 Ross Avenue, Suite 1200
Mail Code: 6EN
Dallas, TX 75202-2733

**RE: Joint Trades Comments
Notice of Proposed NPDES General Permit
Permit for New and Existing Sources and New Dischargers in the Offshore Subcategory of
the Oil and Gas Extraction Category for the Western Portion of the Outer Continental Shelf
in the Gulf of Mexico (GMG290000)
Docket ID No. EPA-R06-OW-2017-0217**

The Offshore Operators Committee (OOC), the American Petroleum Institute (API), and the National Ocean Industries Association (NOIA), hereinafter referred to as “the Joint Trades,” appreciate the opportunity to provide detailed comments on the above-captioned NPDES General Permit. Comments submitted on behalf of the Joint Trades are submitted without prejudice to any member’s right to have or express different or opposing views. It is from this perspective that these comments have been developed.

The Joint Trades

API is a national trade association representing more than 625 member companies involved in all aspects of the oil and natural gas industry. API’s members include producers, refiners, suppliers, pipeline operators, marine transporters, and service and supply companies that support all segments of the industry. API and its members are dedicated to meeting environmental requirements, while economically and safely developing and supplying energy resources for consumers. API is a longstanding supporter of offshore exploration and development and the process laid out in the Outer Continental Shelf Lands Act (“OCSLA”) as a means of balancing and rationalizing responsible oil and gas activities and the associated energy security and economic benefits with the protection of the environment.

NOIA is the only national trade association representing all segments of the offshore industry with an interest in the exploration and production of both traditional and renewable energy resources on the U.S. Outer Continental Shelf (OCS). The NOIA membership comprises more than 325 companies engaged in a variety of business activities, including production, drilling, engineering, marine and air transport, offshore construction, equipment manufacturing and supply, telecommunications, finance and insurance, and renewable energy.

OOC is an organization of 41 producing companies and 53 service providers to the industry who conduct essentially all oil and gas exploration and production activities in the Gulf of Mexico (GOM) OCS.

Founded in 1948, the OOC is a technical advocate for the oil and gas industry regarding the regulation of offshore exploration, development and producing operations in the GOM.

Comments

The Joint Trades' detailed technical comments are included in the attachment. The Joint Trades believe the information included in the attached comments is important and critical to providing a final permit that is protective of water quality in the GOM, as well as a practical permit that allows the continued development of our nation's energy resources. The attached comments are structured to include suggested edits to the proposed permit language and justification for the suggested change.

Cooling Water Intake Structure Entrainment Monitoring

One concern that the Joint Trades would like to highlight is the continued requirements for cooling water intake structure entrainment monitoring (see Comment 37 in the attachment for more details). The Joint Trades strongly object to the continued requirement to conduct ongoing entrainment monitoring. The Joint Trades request the removal of entrainment monitoring/sampling requirement and the addition of language requiring permittees to submit a SEAMAP data report annually.

40 CFR 125.137.a.3 provides the Director the flexibility to reduce the frequency of monitoring following 24 months of bimonthly monitoring provided that "seasonal variations in species and the numbers of individuals that are impinged or entrained" can be detected. The report on the 24 month industry entrainment study (1) documents that many important Gulf of Mexico species were not detected at all in the regions where new facilities are expected to be installed so that entrainment impacts on these species will be zero; (2) provided documentation on the seasonal dependence of species and number of eggs and larvae available for entrainment, and (3) concludes that anticipated entrainment will have an insignificant impact on fisheries in any season; the Joint Trades believes that the intent of 40 CFR 125.137 has effectively been met and that the requirement for ongoing entrainment monitoring can be removed.

Our request is based on the results of the results of the recently completed Gulf of Mexico Cooling Water Intake Structure Entrainment Monitoring Study and reinforced by the quarterly entrainment monitoring reports by individual operators. Industry believes that these results warrant removal of the entrainment monitoring/sampling because (a) the study showed that no meaningful impacts from entrainment are expected; (b) no meaningful impact was found, therefore, the seasonality of the impact is a moot point; (c) the SEAMAP database provides a continually-updated source of information that is functionally equivalent to permit-required monitoring for the purpose of estimating entrainment impacts.

The Gulf of Mexico Cooling Water Intake Structure Entrainment Monitoring Study was conducted for the purposes of informing policy and permit requirements with sound science. The conclusions of the study are clear – there are no meaningful impacts. Yet, the science presented in the study is not being utilized to inform changes to permit requirements.

Regulatory Reform Initiatives

In addition to the detailed, technical comments included with this letter, the Joint Trades also plan to engage EPA Headquarters in discussions regarding the impact of the recent Presidential Executive Orders 13771, *Reducing Regulation and Controlling Regulatory Cost*, and 13795, *Implementing an America-First Offshore Energy Strategy*, on the renewal of NPDES Permit GMG290000. As presented in the attached detailed comments, the Joint Trades offer several positions that question the necessity of changes proposed

in the draft permit. The proposed changes, taken in their entirety, do not appear to be in keeping with the intent of E.O. 13771 and E.O. 13795. Therefore, it is our intent to engage EPA on the need for the proposed changes, whether the proposed changes provide any benefits for water quality of the Gulf of Mexico, and if the proposed changes comply with the Executive Orders.

Also, the Joints Trades, through OOC, will be contacting EPA Region 6 staff, after the comment period closes, to request a meeting to review the attached technical comments, and answer any clarifying questions the agency may have regarding the information provided here.

The Joint Trades appreciate EPA's efforts regarding the draft permit, and look forward to working with the agency on the important issues included in our comments as the permit is finalized. If you have any questions or require additional information, please contact Mr. Greg Southworth at greg@offshoreoperators.com, or Mr. James Durbin at james.durbin@c-ka.com.

Sincerely,



Greg Southworth
Associate Director
Offshore Operators Committee



Amy Emmert
Senior Policy Advisor
American Petroleum Institute



Tim Charters
Senior Director
National Ocean Industries Association

cc (via email):

Environmental Protection Agency:

Scott Pruitt, Administrator
Samuel Coleman, Regional Administrator, Region 6
Bill Honker, Water Division, Region 6
Scott Wilson, Energy Coordinator, Industrial Branch/Water Permits Division
Stacey Dwyer, Associate Director, NPDES Permits & TMDL Branch, Region 6
Brent Larsen, Permits & Technical Section, Region 6
Isaac Chen, Permits & Technical Section, Region 6
Mitty Mohon, NPDES Enforcement Officer, Region 6
Sharon Angove, NPDES Enforcement, Region 6

Bureau of Safety and Environmental Enforcement:

Scott Angelle, Director
Lars Herbst, Gulf of Mexico Regional Director
TJ Broussard, Gulf of Mexico Regional Environmental Officer

Bureau of Ocean Energy Management:

Walter Cruickshank, Acting Director
Michael Celata, Gulf of Mexico Regional Director
Gregory Kozlowski, Gulf of Mexico Deputy Regional Supervisor, Office of Environment

Draft NPDES General Permit for New and Existing Sources and New Dischargers in the Offshore Subcategory of the Oil and Gas Extraction Point Source Category for the Western Portion of the Outer Continental Shelf of the Gulf of Mexico (GMG290000)

GMG290000 May 11, 2017 Draft Renewal Permit, Docket # EPA-R06-OW-2017-0217 – The Joint Trades Comments

General Note – all permit text is shown in quotations. All suggested revisions to the proposed permit text are shown in red and strikethroughs within OOC’s comments.

Comment No.	Type/Category	Permit Section Ref.	Current or Revised Permit Language /Clarifications/Issue	Rationale
1	Notice of Intent	Part I.A.2	“A Notice of Intent (NOI) must be filed 24-hour in advance to cover specific discharges prior to commencement of specified discharges.”	<p><u>The Joint Trades request</u> that the 24-hour requirement of this condition be removed.</p> <p>In certain situations, it is not always feasible for a permittee to file a Notice of Intent (NOI) 24-hours in advance to cover a discharge.</p> <p>Due to potentially sudden and unforeseen changes in operational priority, weather conditions, asset availability/functionality, an operator will not always know about commencement of discharging 24-hours in advance. For example, a lift boat conducting well work operations within a specific field is unexpectedly being reprioritized due to any, or all, of the unforeseen factors mentioned above. This requirement could result in additional costs for the operator up to, and including, the day rate for a drill ship or vessel, approximately \$1 million per day.</p> <p><u>The Joint Trades feels</u> that removing the 24-hour notification is more feasible for compliance, while still obtaining proper NPDES coverage prior to discharging.</p> <p>The draft permit language is more onerous on operators and the additional burden to the O&G Industry does not have any apparent additional protection to the environment.</p>
2	Notice of Intent	Part I.A.2	The primary operator must file an electronic Notice of Intent (eNOI) for discharges directly associated with oil/gas exploration, development or production activities to be covered by this permit. A separate eNOI is required for each lease block and that eNOI shall include all discharges controlled by the primary operator within the block. Other operators or vessel operators must file an eNOI to cover discharges which are directly under their control but are not directly associated with exploration, development or production activities, only if such discharges are not covered by eNOIs filed by the primary operator. Individual coverage by this permit becomes effective when a complete eNOI is signed and submitted.	<p><u>The Joint Trades request</u> striking the red text language. There are instances where third-party operators are in direct control of discharges which are directly associated with exploration, development or production activities. There are also instances when third-party operators may be in direct control of the same type of discharges covered by the eNOI filed by the primary operator. This requirement puts the liability burden on the primary operator for discharges in which they have no direct control.</p> <p>The draft permit language is more onerous on operators and the additional burden to the O&G Industry does not have any apparent additional protection to the environment.</p>
3	Notice of Intent	Part I.A.2	“Note 2: Facilities connected with a bridge (i.e., complex) must file separate eNOIs (i.e., one eNOI for each facility) if both facilities have outfalls for the same type of discharges (e.g., both facilities have outfalls to discharge produced water).”	<p><u>The Joint Trades request</u> clarification on why a separate NOI would now be needed for bridged facilities with duplicate discharges.</p> <ul style="list-style-type: none">• BOEM and BSEE recognize bridged facilities as one complex with a single assigned ID number.• Historically, operators have always reported the worst case for multiple discharges within one permitted outfall or feature (PF), whether reporting by lease block or by structure. (i.e. multiple types of miscellaneous discharges, or multiple outlets of one discharge on stand-alone platforms are reported under a single PF number, and one DMR).

Comment No.	Type/Category	Permit Section Ref.	Current or Revised Permit Language /Clarifications/Issue	Rationale
				<ul style="list-style-type: none"> The total number of permit exceedances will continue to be reported as required for one PF number limit set DMR, including all discharge points on the facility whether bridged or stand alone. Covering and reporting multiple bridged facilities separately will generate more Permitted Feature numbers and additional DMRs to be managed by the electronic reporting system, not to mention additional costs associated with the additional coverage reporting. <p>Therefore, the Joint Trades request that the proposed requirement for separate NOIs be removed from the proposed permit language.</p> <p>The draft permit language is more onerous on operators and the additional burden to the O&G Industry does not have any apparent additional protection to the environment.</p>
4	Notice of Intent	Part I.A.2	<p>“Operators who filed eNOIs under the previous permit, issued on September 28, 2012, (2012 issued permit) are required to file new eNOI within 90 days from the effective date of this general permit. All existing eNOIs under the 2012 issued permit expire 90 days after the effective date of this general permit. If the eNOI system is unavailable During the down time of the eNOI system, operators may submit a short paper NOI which includes information a) through f) listed below or via emails to R6_GMG29TEMPeNOI@epa.gov. The stamp date and time of the sent email is evidence of delivery for coverage. An oOfficial eNOIs shall be filed within 45-days of when the eNOI system becomes available.”</p>	<p><u>The Joint Trades are requesting</u> changes and additions to the permit language to provide clarity when eNOI system is unavailable and thus allowing a short paper NOI submittal. <u>In addition, the Joint Trades are requesting</u> a 45-day time-period for submittal of the official eNOI via the eNOI system in-order to provide clarity of expectations. The current language can imply as soon as the system is available an eNOI must be submitted. Since submitting the short paper NOI will allow for coverage under the permit, a 45-day period to submit the official eNOI is simply administrative.</p> <p>It is not clear as to the timeframe when EPA will update the applicable systems (i.e. eNOI and NetDMR) with the information that is submitted. <u>The Joint Trades request</u> clarification and an estimated schedule of when the applicable systems will be ready for use.</p> <p><u>The Joint Trades are requesting</u> an email address correction based on beta testing issues with EPA Region 6 where it was determined the wrong address was listed in the draft permit.</p> <p>Not accepting the proposed permit language is onerous on operators and an additional burden to the O&G Industry with no apparent additional protection to the environment.</p>
5	Notice of Intent	Part I.A.2	<p>“Facilities which are located in lease blocks that are either in or adjacent to "no activity" areas or require live bottom surveys are required to submit both an eNOI that specifies they are located in such a lease block and a notice of commencement of operations (e.g., drills, installations, discharges, ...)”</p>	<p><u>The Joint Trades request</u> striking out information such as “drills, installations, discharges...”. The information is covered in Part 1. A.2 (a through I). The information regarding drills is covered in the drilling permits to BOEM. Also, it is unclear how this information would be added to the eNOI system. The eNOI system already keeps track of the types of discharges that are being planned.</p> <p>The draft permit language is more onerous on operators and the additional burden to the O&G Industry does not have any apparent additional protection to the environment.</p>
6	Notice of Termination	Part I.A.3	<p>3. Termination of NPDES Coverage</p> <p>Lease holders or the authorized registered operators shall submit a notice of termination (NOT) to the Regional Administrator within one year60 days of termination of lease ownership for lease blocks assigned to the operator by the Department of Interior. (Request for time extension and justification to retain the permit coverage beyond the one year 60-day limit shall be sent to the address listed in the subsection 5 below.) In the case of temporary operations such as hydrostatic testing, well or facility abandonment or any other contractual or legal requirement the NOT shall</p>	<p><u>The Joint Trades request</u> a one year time frame for submittal of NOTs following termination of lease ownership. This request is to account for the many possible reasons a Permittee may be required to hold permit coverage following lease termination.</p> <p>Operators have up to 1-year from lease expiration to remove a facility. During this timeframe, there could be removal and/or abandonment operations that result in discharges authorized by the permit. A one year time period reduces the number of NOTs and NOIs, where an operator terminates coverage and then has to reapply for coverage of discharges with in a one year time frame.</p>

Comment No.	Type/Category	Permit Section Ref.	Current or Revised Permit Language /Clarifications/Issue	Rationale
			be submitted within one year 60 days of termination of operations. The discharge monitoring report (DMR) for the terminated lease block may be either submitted with the NOT, or submitted on the reporting schedule. The NOT shall be effective upon the date it is received by EPA.	The draft permit language is more onerous on operators and the additional burden to the O&G Industry does not have any apparent additional protection to the environment.
7	Other Reporting Requirements	Part I.A.5	<p>“All NOIs must be filed electronically. Instruction for use of the electronic Notice of Intent (eNOI) system is available in EPA Region 6’s website at http://www.epa.gov/region6/6en/w/offshore/home.htm .</p> <p>Operators shall either mail all temporary paper NOIs, NOTs, notices of transfer agreements, notice of merger/acquisition, notice of commencement and all subsequent paper reports under this permit to the following address: Water Enforcement Branch (6EN-WC) U.S. Environmental Protection Agency Region 6 1445 Ross Avenue Dallas, TX 75202 or email pdf documents to an email address at R6_GMG29TEMPeNOI@epa.gov.”</p> <p>If the eNOI system is unavailable, operators may submit a short paper NOI which includes information a) through f) listed in Part I.A.2 via email to R6_GMG29TEMPeNOI@epa.gov. The stamp date and time of the sent email is evidence of delivery for coverage. An official eNOI shall be filed within 45 days of when the eNOI system becomes available.</p> <p>Additional information regarding these reporting requirements may be found at: http://www.epa.gov/region6/6en/w/offshore/home.htm”</p>	<p><u>The Joint Trades are requesting</u> an email address correction based on beta testing issues with EPA Region 6 where it was determined the wrong address was listed in the draft permit.</p> <p><u>The Joint Trades are requesting</u> the additional language to this section of the permit to provide clarity when eNOI system is unavailable and thus allowing a short paper NOI submittal. In addition, OOC is requesting a 45 day time for submittal of the official eNOI via the eNOI system in order to provide clarity of expectations.</p> <p>Further, it should be noted that the EPA website listed is not currently active. <u>The Joint Trades request</u> that this website be activated prior to the effective date of the permit. Additionally, <u>the Joint Trades request</u> the ability to review the electronic NOI instructions prior to them being finalized to allow for clarification and edits as necessary.</p> <p>It is not clear as to the timeframe when EPA will update the applicable systems (i.e. eNOI and NetDMR) with the information that is submitted. <u>The Joint Trades request</u> clarification and an estimated schedule of when the applicable systems will be ready for use.</p> <p><u>The Joint Trades request</u> that in addition to the electronic NOI instructions, a set of instructions also be made available for DMRs and NOTs. Similar to the electronic NOI instructions requested above, OOC further requests the ability to review the electronic NOT and DMR instructions prior to them being finalized to allow for clarification and edits as necessary.</p> <p>See comment # 41 for additional information regarding NetDMR.</p> <p>The lack of active website, email address and NOI, NOT and DMR instructions is very onerous on operators and the burden to the O&G Industry does not have any apparent additional protection to the environment.</p>
8	Non-Aqueous Based Drilling Fluid - Retention of Cuttings and BMP	Part I.B.2.c.2	<p><u>Base Fluids Retained on Cuttings.</u> Monitoring shall be performed at least once per day when generating new cuttings, except when meeting the conditions of the Best Management Practices described below. Operators conducting fast drilling (i.e., greater than 500 linear feet advancement of the drill bit per day using non aqueous fluids) shall collect and analyze one set of drill cuttings samples per 500 linear feet drilled, with a maximum of three sets per day. Operators shall collect a single discrete drill cuttings sample for each point of discharge to the ocean. The weighted average of the results of all discharge points for each sampling interval will be used to determine compliance. See Part I, Section D.123 of this permit.</p> <p>b) BMP Plan Requirements</p> <p>The BMP Plan may reflect requirements within the pollution prevention requirements required by the Minerals Management Service Bureau of</p>	<p><u>The Joint Trades are requesting</u> the changes to reference the correct section of the permit and the agency that replaced Mineral Management Service.</p>

Comment No.	Type/Category	Permit Section Ref.	Current or Revised Permit Language /Clarifications/Issue	Rationale
			Safety and Environmental Enforcement (BSEE) (see 30 CFR 250.300) or other Federal or State requirements and incorporate any part of such plans into the BMP Plan by reference.	
9	Produced Water	Part I.B.4.a	<p>"The addition of dispersants or emulsifiers downstream of treatment system to the overboard produced water discharge lines is prohibited.40 CFR § 110.4."</p>	<p><u>The Joint Trades agree</u> that the use of dispersants or emulsifiers downstream of the treatment system for the purpose of preventing detection of a sheen is prohibited.</p> <p>In the 1989 API Paper (attached as Appendix A): Chemical Treatments and Usage in Offshore Oil and Gas Production Systems, by Hudgins, the use of dispersants is discussed. Dispersants are added to scale control agents and corrosion inhibitors to increase performance.</p> <p>As proposed, EPA would inadvertently be limiting the use of scale control agents, corrosion inhibitors, and emulsifiers from being used both upstream and in the produced water treatment system. <u>The Joint Trades do not believe this was the intent and request</u> the requirement be clarified to only prohibit the addition of dispersants or emulsifiers downstream of the produced water treatment system.</p> <p>The following is copied from the 1989 API paper mentioned above, from the "Emulsion Breakers" section on page 20 of the report.</p> <p>"However, the use of emulsifiers in the treatment system are necessary in the separation phase. Emulsion breakers work by attacking the droplet interface. They may cause the dispersed droplets to aggregate intact (flocculation) or to rupture and coalesce into larger droplets. Either way, the density difference between the oil and water then causes the two liquid phases to separate more rapidly. In addition, solids present will usually tend to accumulate at the liquid level interface (between the bulk oil and water phases) and form a semi-solid mass. If these solids are not dispersed into the oil phase or water wetted and removed with the water, the interface detector in the control system will ultimately malfunction, causing water to be dumped into the oil pipeline or oil to be carried over to the produced water system. Proper selection and application of emulsion breaker will minimize this accumulation and the resulting problems" (Hudgins, C. M., Jr. (1989). CHEMICAL TREATMENTS AND USAGE IN OFFSHORE OIL AND GAS PRODUCTION SYSTEMS. Houston, TX).</p> <p>The draft permit language is more onerous on operators and the additional burden to the O&G Industry does not have any apparent additional protection to the environment.</p>
10	Produced Water – Oil and Grease	Part I.B.4.b.2	<p>"2) Oil and Grease. Samples for oil and grease monitoring shall be collected and analyzed a minimum of once per month. In addition, a produced water sample shall be collected, within thirty (30) minutes two hours of when a sheen is observed in the vicinity of the discharge or within two hours after startup of the system if it is shut down following a sheen discovery, and analyzed for oil and grease. The sample type for all oil and grease monitoring shall be either grab, or a composite which consists of the arithmetic average of the results of grab samples collected at even intervals during a period of 24-hours or less. If only one sample is taken for any one month, it must meet both the daily maximum and monthly average limits. Samples for oil and grease monitoring shall be collected prior to the addition of any seawater to the produced water waste stream. The analytical method is that specified at 40 CFR Part 136."</p>	<p><u>The Joint Trades strongly disagree</u> with taking a sample within 30 minutes of a sheen. The first response by operators is determining the cause or source of the sheen and deciding if the system needs to be shut down. By taking a sample within 30 minutes, operators will be more focused on taking a sample instead of stopping the sheen. The uncertainty of the origin of the sheen could cause operations to be in a state of higher risk of uncertainty and may lead to unduly endangering the health and safety of the facility personnel, the facility, and the environment. Also, the PW O&G kits are not always located in areas that are easily accessible. It might take an operator over 30 minutes to grab a kit, collect ice, complete paperwork, and take a sample. By not taking a sample within the 30-minute time frame, this will now put operators in possible violation of the permit. <u>The Joint Trades request</u> that time allowed to take a produced water sample after a sheen is observed remain at two hours.</p>

Comment No.	Type/Category	Permit Section Ref.	Current or Revised Permit Language /Clarifications/Issue	Rationale
				<p>Additionally, the Joint Trades request the language for sample type remain as is in the current permit. Some operators elect to collect grab samples over a 24-hour period and determine the arithmetic average for compliance with the daily maximum limit.</p> <p>The draft permit language is more onerous on operators and the additional burden to the O&G Industry does not have any apparent additional protection to the environment.</p>
11	Produced Water – Toxicity	Part I.B.4.b.3	<p>“Toxicity. A 7-day toxicity testing shall be performed twice once per calendar year. Toxicity testing must be conducted at least 90 days apart. The results for both species shall be reported on the next quarterly DMR following testing. See Part I, Section D.3 of this permit for WET testing requirements.”</p>	<p><u>The Joint Trades request</u> the current produced water toxicity testing frequency and language remain the same. The majority of operators test for produced water on an annual frequency. Therefore, we strongly encourage EPA to maintain the annual produced water toxicity testing frequency as there is not enough justification for an increased frequency of toxicity testing. Per EPA’s proposed permit fact sheet, EPA is removing the frequency reduction allowance for toxicity testing based on the Bureau of Safety and Environmental Enforcement (BSEE)’s suggestion. BSEE’s basis of “difficulty of tracking” is completely invalid as once per calendar year is much easier to track than twice per calendar year and at least 90 days apart.</p> <p>EPA acknowledges in their proposed permit’s fact sheet that the number of available, experienced, and qualified laboratories for this 7-day produced water analysis is limited. We agree with this statement. Given the number of facilities requiring testing, the available laboratories cannot handle doubling the number of 7-day toxicity analyses that EPA/BSEE is proposing. This in turn could cause false toxicity or quality control issues. Laboratories only culture so many test age organisms. Increasing the number of required testing in short time frame is not possible. With the current annual required toxicity testing there are issues collecting and analyzing 100% of samples due to limited laboratory availability. There are only 3 laboratories that can perform testing on offshore oil and gas produced waters. Inability to predict extended platform downtime periods (i.e. intermittent production), logistics issues for these specific monitoring and testing requirements, and weather (i.e. hurricanes and other tropical storms) can also be problematic with an increase in testing. Doubling the number of required toxicity testing samples would not only increase the burden on the operator and the testing laboratories, but it will increase the operator’s risk for additional missed samples resulting in administrative non-compliances. An annual testing frequency allows operators and laboratories to work together on scheduling around shut-in, weather, organism availability and laboratory testing schedules.</p> <p>Currently, the permit requires that the toxicity sample has to be representative of produced water discharges. Annual toxicity tests are inclusive to all activity performed on the facility; therefore, it is a representative sample. Daily production rate changes and additions of flow back fluids are not only unpredictable and hard to track, but these changes in production are monitored monthly by conducting a representative sample for an oil and grease analysis on produced water. The language throughout the permit requires representative samples be collected. As an example, Section II.C.2 of the permit requires “<i>Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity.</i>”</p> <p>This proposed frequency increase will be a significant economic burden for offshore operators currently on an annual frequency as well. These additional toxicity tests would be an increase for routine produced water discharges in operating expenses with negligible value. Considering the very low number of toxicity test failures based on actual lab results, there is no environmental benefit to justify this increased expense.</p>

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				<p>The Joint Trades request an effective date for produced water toxicity testing of January 1, 2018 and continue on a calendar year basis. This assumes the permit will become effective on October 1, 2017. Operators have 90 days to apply for coverage under the new permit, and then can plan a reasonable schedule for testing.</p> <p>See also Comments No. 12-13 for additional discussion and information.</p> <p>The draft permit language is more onerous on operators and the additional burden to the O&G Industry does not have any apparent additional protection to the environment.</p>
12	Produced Water – Toxicity	Part I.B.4.b.3	<p>“Toxicity testing for new discharges shall be conducted within 90 days 30 days after the discharge begins and then continue on the appropriate calendar year follow the twice per calendar year schedule.”</p>	<p>EPA has not provided rationale for decreasing the time to conduct toxicity tests for new discharges. <u>The Joint Trades request</u> the 90-day time period be left unchanged for the following reasons:</p> <ul style="list-style-type: none"> • New produced water discharges typically occur early in the life of the facility. The PW discharge rates are typically very low and ramp up over time at a rate dependent on the reservoir(s). • At these low produced water rates, the produced water treatment system needs time to be fully commissioned. • The critical dilution is set based on the highest monthly average discharge rate for the three months prior to the month in which the test sample is collected. Testing within the first 30 days would not allow for even one monthly average discharge rate in which to base critical dilution. <p>See Comments No. 11 and 13 for additional discussion and information.</p> <p>The draft permit language is more onerous on operators and the additional burden to the O&G Industry does not have any apparent additional protection to the environment.</p>
13	Produced Water – Toxicity	Part I.B.4.b.3	<p>“Toxicity testing for existing discharges under the 2012 issued permit shall conduct the first toxicity test within 6 months from the effective date of obtaining coverage under the permit.”</p> <p>“Samples taken in Year 2017 prior to the effective date of this permit can be reported for 2017.”</p>	<p><u>The Joint Trades request</u> the permit change to provide clarity and a more realistic approach with what we believe is the intent of the proposed permit language.</p> <p>Operators have 90 days from the effective date of the permit to apply and obtain coverage under the new permit. Requiring existing discharges to conduct the first test within 6 months from the effective date of the permit is problematic. 6 months from the effective date of the permit would mean that first test for all existing discharges must be tested by the end of March 2018. Again, this is problematic for operators that do not apply for coverage until the end of the 90 days. Thus, nearly all of the produced water toxicity tests would have to be completed in a short time frame.</p> <p>As discussed in Comment No. 11, there are a limited number of qualified testing laboratories that test offshore produced waters. The testing laboratories could become overwhelmed with that amount of produced water testing to be done in a short time frame. All existing produced water discharges would have to be tested in approximately 3 months. From a transportation and logistics point of view, this would be very problematic and cause a financial burden to both the operator and the testing laboratories. Thus, potentially leading to false toxicity results and quality control issues. Laboratories only produce so many test age organisms, increasing the number of required testing in a short time frame is not possible.</p>

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				<p>Additionally, the Joint Trades request the additional language to clarify that samples taken in 2017 during the transition period can be reported for 2017, as compliance with the existing permit.</p> <p>See Comments No. 11-12 for additional discussion and information.</p> <p>The draft permit language is more onerous on operators and the additional burden to the O&G Industry does not have any apparent additional protection to the environment.</p>
14	Produced Water – Toxicity	Part I.B.4.b.3	<p>“Samples also shall be representative of produced water discharges when hydrate inhibitors, scale inhibitors, corrosion inhibitors, biocides, paraffin inhibitors, well completion fluids, workover fluids, well treatment fluids, and/or hydrate control fluids are used in operations. The operator must conduct a new toxicity test if the sample used for the previous test did not represent an application of flow back of well completion fluids, workover fluids, well treatment fluids, or hydrate control fluids.”</p>	<p>The Joint Trades request striking the requirement to conduct a new toxicity test if the sample used for the previous test did not represent an application of TCW or hydrate control fluids. At some locations, hydrate control fluids are routinely used as production treatment chemicals. The current permit already requires that samples are representative. EPA did not provide rationale as to why hydrate control fluids should be treated differently from other production chemicals.</p> <p>This new requirement is overly burdensome with the following challenges:</p> <ul style="list-style-type: none"> • The TCW study is not complete. OOC requests that TCW discharges planned to be commingled with produced water be included in the TCW study scope. • For facilities with third-party wells tied back to the production system, there is the added challenge of the host facility knowing exactly when these fluids were commingled with the produced water discharge to determine when a representative sample can be obtained. Although it may be communicated by a third-party in advance, there is the uncertainty of how long it will take these fluids to reach the facility and be treated before impacting the produced water discharge. • Toxicity testing timing is coordinated well in advance with testing laboratories. This enables the testing lab to 1). coordinate and send toxicity test kits to the facility in alignment with existing transportation schedules and 2). have organisms prepped and available for the toxicity test. The addition of samples for TCW and hydrate control fluids, which may not be known in advance, is overly burdensome and may result in non-compliance due to inability to obtain samples and start the toxicity testing within hold times. • Discrete instances of TCW fluids commingled with produced water are short in duration and careful planning would need to be in place in order to obtain a representative sample with no guarantee that can be accomplished. • The permit language is very broad and lacks clarity. Operational scenarios frequently change. As worded, it will be almost impossible for an operator to determine daily whether the previous test was representative of current conditions and an additional toxicity test would need to be conducted. <p>For additional discussion and information, see Comments 19-21.</p> <p>The draft permit language is more onerous on operators and the additional burden to the O&G Industry does not have any apparent additional protection to the environment.</p>
15	Produced Water – Toxicity	Part I.B.4.b.3 and Part I.D.3.e	<p>Part I.B.4.h.3</p> <p>“If a test fails the survival or sub-lethal endpoint at the critical dilution in any test, the operator must perform monthly retest until it passes. The operator shall take corrective actions which may include conduction of Toxicity Reduction Evaluation (TRE), adjustment of discharge rate, addition</p>	<p>The Joint Trades agree with Part I.B.4.b.3, once a test fails, the operator should conduct monthly retests until passing. To be consistent, the Joint Trades also request EPA change the language in Part 1.D.3.e as indicated. Historically, when a facility passes the first toxicity test, they pass the second and third toxicity test as well. Performing three consecutive monthly toxicity tests adds no value and becomes redundant.</p>

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			<p>of diffusers, or other remedy actions after the failure of the first retest. Failing the toxicity test is considered violation of the permit.”</p> <p>Part I.D.3.e</p> <p>“If the effluent fails the survival endpoint or the sub-lethal endpoint at the critical dilution, the permittee shall be considered in violation of the WET limit. Also, when the testing frequency stated above is less than monthly and the effluent fails either endpoint at the critical dilution, the monitoring frequency for the affected species will increase to monthly until such time as compliance with the NOEC effluent limitation is demonstrated, for a period of three consecutive months, at that time the permittee may return to the testing frequency in use at the time of the failure. During the period the permittee is out of compliance, test results shall be reported on the DMR for that reporting period.”</p>	
16	Produced Water – Visual Sheen	Part I.B.4.b.4	<p>“...The operator shall report “sheen” whenever a sheen is observed during the day and must conduct an inspection of treatment process and investigation of If a sheen is observed in the course of required daily monitoring , or at any other time, the Operator must record the sheen and assess the cause of sheen. The operator must keep records of sheens and findings and make the records available for inspector’s review.”</p>	<p>The Joint Trades request that the language be modified as indicated to provide clarification.</p> <p>Operators are required to keep adequate records to assure proper reporting of produced water sheens under the permit per Part II.C and II.D. A produced water sheen may be easily attributed to a change in operations (e.g., well management) thus making an inspection of the system unnecessary. The proposed permit language is vague and overly burdensome.</p> <p>The draft permit language is more onerous on operators and the additional burden to the O&G Industry does not have any apparent additional protection to the environment.</p>
17	Produced Water and Other – Visual Sheen reporting to NRC	Part I.B.4.b.4 & Part I.C.7	<p>Part I.B.b.4 “A visual observation of a sheen is presumed to be a discharge within the meaning of 33 U.S.C. §§ 1321(a)(2) and (b)(3), and must be reported to the National Response Center (NRC) pursuant to 40 CFR § 110.6”</p> <p>Part I.C.7 “This permit does not preclude permittees from reporting discharges/releases to the National Response Center (NRC). A visual observation of a sheen is presumed to be a discharge within the meaning of 33 U.S.C. §§ 1321(a)(2) and (b)(3), and must be reported to the National Response Center (NRC) pursuant to 40 CFR § 110.6”</p>	<p>The Joint Trade strongly disagree that discharges from permitted outfalls should be reported to the NRC. Thus, the <u>Joint Trades request</u> deletion of the text from Part I.B.b.4 and Part I.C.7. Additionally, the <u>Joint Trades request</u> deletion of the term “discharges” from the text at Part I.C.7. The statements at Part I.B.b.4 and Part I.C.7 are contrary to law.</p> <p>Based on Congressional intent and prior interpretations by the EPA and USCG, NPDES discharges are covered by section 402 of the Clean Water Act and are not subject to reporting as oil spills under section 311. Therefore, requiring an operator to report sheens from permitted discharge points to the NRC is contrary to law, and this requirement must be removed from the proposed permit.</p> <p>The following citations from 33 U.S.C. (the Clean Water Act), historical EPA and USCG documents, and EPA’s current website are provided to support this conclusion.</p> <p>1. 33 U.S.C. § 1321 Excludes Certain Situations from the Definition of “Discharge”</p> <p>Parts I.B.b.4 and I.C.7 include new requirements for an operator to report sheens from permitted discharge points to the NRC. The proposed permit cites 33 U.S.C. § 1321(a)(2) and (b)(3) as the basis for such reporting. However, 33 U.S.C. § 1321(a)(2) and (b)(3), are the exact paragraphs that explain that NPDES discharges are excluded from the definition of “discharge” and do not have to be reported to the National Response Center.</p> <p>Paragraph 33 U.S.C. § 1321(b)(3) states,</p>

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				<p><i>“The discharge of oil or hazardous substances (i) into or upon the navigable waters of the United States, adjoining shorelines, or into or upon the waters of the contiguous zone, or (ii) in connection with activities under the Outer Continental Shelf Lands Act [43 U.S.C. 1331 et seq.] or the Deepwater Port Act of 1974 [33 U.S.C. 1501 et seq.], or which may affect natural resources belonging to, appertaining to, or under the exclusive management authority of the United States (including resources under the Magnuson-Stevens Fishery Conservation and Management Act [16 U.S.C. 1801 et seq.]), in such quantities as may be harmful as determined by the President under paragraph (4) of this subsection, is prohibited, except (A) in the case of such discharges into the waters of the contiguous zone or which may affect natural resources belonging to, appertaining to, or under the exclusive management authority of the United States (including resources under the Magnuson-Stevens Fishery Conservation and Management Act), where permitted under the Protocol of 1978 Relating to the International Convention for the Prevention of Pollution from Ships, 1973, and (B) where permitted in quantities and at times and locations or under such circumstances or conditions as the President may, by regulation, determine not to be harmful. Any regulations issued under this subsection shall be consistent with maritime safety and with marine and navigation laws and regulations and applicable water quality standards.”</i></p> <p>The key term in the paragraph is “discharge” – which is defined in 33 U.S.C. § 1321 (a)(2), “discharge” includes, but is not limited to, any spilling, leaking, pumping, pouring, emitting, emptying or dumping, but excludes (A) discharges in compliance with a permit under section 1342 of this title, (B) discharges resulting from circumstances identified and reviewed and made a part of the public record with respect to a permit issued or modified under section 1342 of this title, and subject to a condition in such permit,,[1] (C) continuous or anticipated intermittent discharges from a point source, identified in a permit or permit application under section 1342 of this title, which are caused by events occurring within the scope of relevant operating or treatment systems, and (D) discharges incidental to mechanical removal authorized by the President under subsection (c) of this section;</p> <p>This definition excludes from the definition of “discharge” sheens that occur from permitted discharge points, as these are covered by the exclusions described in 1321(a)(2) (A), (B), or (C). Therefore, sheens from permitted discharges are excluded from the definition of “discharge” under 33 U.S.C. § 1321.</p> <p>2. EPA Clarified the Reporting Requirements in the 1981 Permit Fact Sheet – Sheens from Permitted Point Sources are Exempt from Reporting</p> <p>This position is further supported by a 1981 <i>Federal Register Notice</i> (46 FR 20284, April 3, 1981) regarding the <i>Issuance of Final General NPDES Permits for Oil and Gas Operations in Portions of the Gulf of Mexico; Fact Sheet</i>, hereinafter referred to as “the 1981 Fact Sheet.” Paragraph J, <i>Oil Spill Requirements</i>, of the 1981 Fact Sheet states,</p> <p><i>“Section 311 of the Act prohibits the discharge of oil and hazardous materials in harmful quantities. In the 1978 amendments to section 311, Congress clarified the relationship between this section and discharges permitted under section 402 of the Act. It was the intent of Congress that routine discharges permitted under</i></p>

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				<p>section 402 be excluded from section 311. Discharges permitted under section 402 are not subject to section 311 if they are:</p> <ol style="list-style-type: none">1. In compliance with a permit under section 402 of the Act;2. Resulting from circumstances identified, reviewed and made part of the public record with respect to a permit issued or modified under section 402 of the Act, and subject to a condition in such permit; or3. Continuous or anticipated intermittent discharges from a point source, identified in a permit or permit application under section 403 of this Act, which are caused by events occurring within the scope of the relevant operating and treatment systems. <p>To help clarify the relationship between discharges under section 402 and section 311 discharges, EPA has compiled the following list of discharges which it considers to be regulated under section 311 rather than under a section 402 permit. The list is not to be considered all-inclusive.</p> <ol style="list-style-type: none">1. Discharges from a platform or structure on which oil or water treatment equipment is not mounted,2. Discharges from burst or ruptured pipelines, manifolds, pressure valves or atmospheric tanks,3. Discharges from uncontrolled wells,4. Discharges from pumps or engines,5. Discharges from oil gauging or measuring equipment,6. Discharges from pipeline scraper, launching, and receiving equipment,7. Spill of diesel fuel during transfer operations,8. Discharge from faulty drip pans,9. Discharges from well heads and associated valves,10. Discharges from gas-liquid separators, and11. Discharged from flare lines.” <p>It is clear from the 1981 Fact Sheet discussion that EPA clarified, based on Congressional intent, that point sources covered by an NPDES permit are not subject to section 311 of the Clean Water Act; meaning such discharges are not reportable to the NRC.</p> <p>3. USCG District 8 (1998) Issued a Memorandum Explaining Sheens from Permitted Discharges are not Subject to NRC Reporting</p> <p>Furthermore, in September 1997 members of the Offshore Operators Committee met with U.S. Coast Guard District 8 staff to clarify proper reporting procedures for sheens from permitted point sources (section 402 events) versus oil spills (section 311 events). The Commander of the Eighth Coast Guard District issued a memorandum (dated April 3, 1998) that states,</p> <p>“...It was agreed by all in attendance that Section 311 of the Clean Water Act does not define oil discharges from NPDES-permitted sources (whether the system is operating correctly or not) as reportable oil discharges. This conclusion is supported by Commandant Decisions on Appeal. The attendees agreed that the proper policy is for sources to report discharges in violation of their NPDES-permitted processes to the Environmental Protection Agency and Minerals Management Service (if appropriate) and not to the Coast Guard. Discharges of oil resulting from other activities not part of a NPDES process will still be reported to the Coast Guard National Response Center.”</p>

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				<p>This USCG memorandum, has not been rescinded and is still in effect. This District 8 policy is clearly in alignment with 33 USC §1321 and the 1981 Fact Sheet.</p> <p>4. EPA Response to Comments for the 2007 GMG290000 Renewal</p> <p>EPA Region 6 addressed the issue of reporting sheens to the USCG National Response Center directly in the Response to Comments when the agency issued the Final NPDES General Permit for Discharges from New and Existing Sources in the Offshore Subcategory of the Oil and Gas Extraction Point Source Category for the Western Portion of the Outer Continental Shelf of the Gulf of Mexico (GMG290000). The following text is taken directly from the Response to Comments:</p> <p>“Comment Number 1:</p> <p style="padding-left: 40px;"><i>The Offshore Operators Committee (OOC) requested clarification of the permit’s oil spill requirements to state that sheens resulting from permitted discharges are not defined as spills.</i></p> <p>Response:</p> <p style="padding-left: 40px;"><i>EPA has previously worked with the U.S. Coast Guard to determine when a sheen would be considered a spill. Sheens from non-permitted discharges were determined to be spills which are under the jurisdiction of the U.S. Coast Guard. Sheens which result from permitted discharges were determined to be under EPA jurisdiction and are not considered to be spills. The requested clarification is consistent with that determination and has been made in the final permit.”</i></p> <p>It is apparent that EPA has reviewed this reporting issue in previous iterations of the GMG290000 permit and made the determination that sheens from permitted discharges are not oil spills. The permit and agency processes ensure sheens from permitted discharge points are reported through the Discharge Monitoring Reports.</p> <p>5. EPA’s Current Website Describes the Types of Discharges Exempt from 33 U.S.C. § 1321</p> <p>Finally, EPA’s current website (https://www.epa.gov/oilspills-prevention-and-preparedness-regulations/oil-spills-do-not-need-be-reported) contains information on “Oil Spills that Do Not Need to be Reported” which includes a section on “NPDES-Permitted Releases” that provides yet another summary of the definition of discharge in 33 U.S.C. § 1321 (a)(2):</p> <p>“Three types of discharges subject to the National Pollutant Discharge Elimination System (NPDES) are exempt from oil spill reporting:</p> <ol style="list-style-type: none">1. Discharges in compliance with a permit under section 402 of the Clean Water Act, when the permit contains:<ul style="list-style-type: none">• Either an effluent limitation specifically applicable to oil, or• An effluent limitation applicable to another parameter that has been designated as an indicator of oil;2. Discharges resulting from circumstances identified and reviewed and made part of the public record with respect to a permit issued or modified under section 402 of the Clean Water Act, and subject to a condition in such permit. This exclusion addresses situation where the source, nature, and amount of a potential oil discharge was identified, and a treatment system capable of preventing that discharge was made a permit requirement.

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				<ul style="list-style-type: none"> For example, if a discharger has a drainage system that will route spilled oil from a broken hose connection to a holding tank for subsequent treatment and discharge, the treatment system must be sufficient to handle the maximum potential spill from that source. Spills larger than those contemplated in the public record are not exempted; and <p>3. Continuous or anticipated intermittent discharges from a point source, identified in a permit or permit application under section 402 of the Clean Water Act, which are caused by events occurring within the scope of relevant operating or treatment systems. This exclusion applies to chronic or anticipated intermittent discharges originating in the manufacturing or treatment systems of a facility or vessel, including those caused by periodic system failures.</p> <ul style="list-style-type: none"> Discharges caused by spills or episodic events that release oil to the manufacturing or treatment systems are not exempt from reporting.” <p>The information above provides additional clarity on the intent of 33 U.S.C. § 1321 (a)(2). Clearly, point source discharges in compliance with permit requirements are exempt from section 311 reporting. Also, limitations described for various point source discharges included in the GOM NPDES permit are part of the public record, including the fact that sheens may occur from these discharges. Lastly, Item 3 from the website description above makes it clear that episodic events caused by “periodic system failures,” for example a sheen from deck drainage or the produced water treatment process, are also exempt from section 311 reporting.</p> <p>6. Conclusion</p> <p>Based on Congressional intent and prior interpretations by the EPA and USCG, it is clear that NPDES discharges are covered by section 402 of the Clean Water Act, and are not subject to reporting under section 311. Therefore, the requirement to report sheens from permitted discharge points to the NRC must be removed from the proposed permit. Reporting of sheens from permitted discharge points is managed through the Discharge Monitoring Reports, and such events will be reported to EPA as permit excursions/violations. However, sheens from permitted discharge points need not be reported to the NRC.</p> <p>The draft permit language is more onerous on operators and the additional burden to the O&G Industry does not have any apparent additional protection to the environment.</p>
18	Well Treatment Fluids, Completion Fluids, Workover Fluids – Priority Pollutants	Part I.B.6.a	<p>“Vendor certification declaration or statement indicating the fluids contain no the vendor does not add or has not intentionally added priority pollutants to the fluids is acceptable for meeting this requirement. In case either a vendor certification is not available or the presence of priority pollutants is in doubt, “Trace amounts” shall mean the amount equal to or less than the most sensitive method detection limit listed in 40 CFR Part 136 for the applicable parameter or as sensitive as MQLs listed in Appendix E of the permit.”</p>	<p><u>The Joint Trades request</u> rewording the first sentence to clarify that the vendor declaration is that no priority pollutants are intentionally added to the materials added downhole as well treatment, completion, or workover fluid TCW. If priority pollutants were not intentionally added to the formulation of the product, then they are considered to be in there only in trace quantities.</p> <p>Further, the <u>Joint Trades request</u> the deletion of the last sentence.</p> <p>The proposed EPA Region 6 language contradicts the 1993 ELG decision to regulate priority pollutants with oil and grease only. The documentation and the effluent limitation guidelines development document (in tables X-12, X-13, X14) clearly document that the EPA recognized trace amounts of priority pollutants in these fluids above the detection methods. Imposing MDL limits on all 138 priority pollutants will result in significant non-water quality impacts associated with transportation, discharge, disposal, and excess treatment. The method detection limits</p>

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				<p>referenced in Appendix E are achievable for samples in clean water effluents but due to matrix effects may not be applicable to the analyses of products or TCW discharges.</p> <p>A certification program would be burdensome and unsuitable for 138 priority pollutants and all products used in completion fluids systems. There is no apparent environmental benefit over the current system of regulatory control for the significant costs that this would entail. Consequently, an unintended certification program would result in non-water quality impacts which will result in additional treatment and discharges.</p> <p>The draft permit language is more onerous on operators and the additional burden to the O&G Industry does not have any apparent additional protection to the environment.</p>
19	Well Treatment Fluids, Completion Fluids, Workover Fluids – Fluids Commingled with Produced Water	Part I.B.6.b	<p>“When well treatment, completion or workover fluids are commingled and discharged with produced water, the discharges are considered produced water and a 7-day toxicity test shall be conducted for produced water commingled with well treatment, completion or workover fluids for monitoring and reporting purposes.”</p>	<p><u>The Joint Trades request</u> deleting the 7-day toxicity test requirement. As outlined in the rationale in Comment No. 14 for Part I.B.4.b.3, this requirement is overly burdensome. Toxicity testing for these discharges should be included in the scope of the TCW study.</p> <p>The draft permit language is more onerous on operators and the additional burden to the O&G Industry does not have any apparent additional protection to the environment.</p>
20	Well Treatment Fluids, Completion Fluids, Workover Fluids – Characteristic Assessments	Part I.B.6.c	<p>Operators must conduct well treatment fluids, well completion fluids, and workover fluids assessments whenever they apply those fluids. Such assessments shall be conducted for each applicable well by operators either corporately or individually. The general information of a specific well treatment, well completion or workover fluid could be used for assessment purposes.</p> <p>Each fluid assessment shall include the following information:</p> <ol style="list-style-type: none"> 1) Lease and block number 2) API well number 3) Type of well treatment or workover operation conducted 4) Date of discharge 5) Time discharge of TCW fluids commenced 6) Duration of discharge of TCW fluids 7) Volume of well treatment 8) Volume of completion or workover fluids used 9) The identity, as listed on the applicable SDS, and nominal concentration of each chemical constituent intentionally added to the well treatment, completion, or workover fluid used. The common names and chemical parameters for all additives to the fluids 10) The volume of each additive 11) Concentration of all additives in the well treatment 12) Concentration of all additives in the completion, or workover fluid 10) The No Observable Effect Concentration (NOEC) of 48-hour acute Whole Effluent Toxicity (WET) test for well treatment TCW fluids used. discharged separately from the produced water discharge 	<p><u>The Joint Trades request</u> that any requirements for disclosure of treatment, completion and workover fluid compositional information be clarified as to the extent of disclosure required. Proposed revision reflects a requirement for disclosure of composition as described on the SDS for relevant additives.</p> <p>Additionally, <u>the Joint Trades request</u> that the disclosure requirement allow for the use of a systems-style disclosure of the chemical composition of all additives in a fluid (or fluids, in the case of multiple disclosed applications) consistent with the approach that has been adopted for use in some jurisdictions and by FracFocus. System-style disclosure would satisfy the objectives of the permit revision while potentially reducing the necessity for companies to make confidential business information claims on such disclosures. The process known as system-style disclosure lists all known chemical constituents in a fluid (or fluids, in the case of multiple disclosed applications), but decouples those constituents from their parent additives, thus improving protection of the proprietary chemistry used in the applications while promoting greater disclosure. At the same time, in order to protect the substantial investment of time and resources in developing proprietary products, it is critical that operators and service companies have the ability to protect proprietary information as Confidential Business Information even when using a systems-style approach.</p> <p>Also, <u>the Joint Trades request</u> that service providers be permitted to disclose the trade secret/CBI information directly to EPA rather than requiring disclosure through the operators. Such independent disclosure is necessary in order to protect the substantial investment of time and resources that service providers make in developing proprietary products. Chemical additives play a critical role in the safety, efficiency and productivity of offshore wells, and access to newly-developed, ever-improving chemicals—be they “greener,” more efficient or more effective—is in turn critical to continued improvements in offshore operations.</p> <p>Without these changes, this proposed requirement creates challenges for companies that may manufacture products which contain proprietary components or trade secrets. Companies with trade secrets could experience significant negative economic impacts if a proprietary additive was “reverse engineered” based on information submitted to EPA as part of this requirement.</p>

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			<p>Operators shall use the following methods to perform the 48-hour Acute Whole Effluent Toxicity Test Method:</p> <p>a) The permittee shall utilize the Mysisidopsis bahia (Mysid shrimp) acute static renewal 48-hour definitive toxicity test using EPA-821-R-02-012. A minimum of five (5) replicates with eight (8) organisms per replicate must be used in the control and in each effluent dilution of this test.</p> <p>b) The permittee shall utilize the Menidia beryllina (Inland Silverside minnow) acute static renewal 48-hour definitive toxicity test using EPA-821-R-02-012. A minimum of five (5) replicates with eight (8) organisms per replicate must be used in the control and in each effluent dilution of this test.</p> <p>c) The NOEC is defined as the greatest effluent dilution which does not result in lethality that is statistically different from the control (0% effluent) at the 95% confidence level.</p> <p>Information collected for this reporting requirement shall be submitted as an attachment to the DMR or in an alternative format requested by the operator and approved by EPA Region 6. Operators may submit this information marked as “Confidential Business Information” or other suitable form of notice or may have service providers independently submit this information marked as such, if necessary. The information so marked shall be treated as information subject to a business confidentiality claim pursuant to 40 CFR Part 2.</p>	<p>The Occupational Safety and Health Administration (OSHA) has addressed similar challenges in its Hazard Communication requirements. Specifically, OSHA has provided criteria that allow manufacturers to deem a chemical component as a “trade secret” on a Safety Data Sheet (SDS) (see 29 CFR 1910.1200(i)). Under the OSHA Hazard Communication requirements, a proprietary chemical component that has been designated as a trade secret is listed on the SDS in a generic manner, such “Proprietary Component A.”</p> <p>Given the above, <u>the Joint Trades are requesting</u> that EPA Region 6 incorporate the OSHA Hazard Communication trade secret criteria by reference in the proposed GMG290000 permit.</p> <p>Under this proposed change, EPA Region 6 would still have access to information that priority pollutants are present or not in a particular additive, and the proprietary nature of certain additives would be protected. This added language would also bring the two regulatory programs into alignment, making compliance straightforward and consistent. If a specific identity of a chemical compound can be withheld on an SDS while still communicating sufficient information to ensure the safe handling, use and disposal of the chemical compound, then it is reasonable to allow it to be withheld from the reporting of fluid discharges wherein the chemical compound is greatly diluted.</p> <p>This approach aligns with the disclosure of hydraulic fracturing chemicals used in the onshore oil and gas industry. The FracFocus Chemical Disclosure Registry (www.fracfocus.org) allows chemicals in the registry to be designated as proprietary if the chemical has been determined to meet the OSHA trade secret criteria.</p> <p><u>The Joint Trades request</u> that TCW toxicity testing be conducted on the total TCW job constituents prepared either by the company performing the job or the toxicity testing laboratory that is representative of all fluids used in the job in lieu of sampling the discharge. There are several challenges with collecting a representative sample during discharges.</p> <ol style="list-style-type: none">1. In order to obtain an optimum dilution series, a range finder will likely be needed. Without a rangefinder, the NOEC may not be representative of actual NOEC. Due to the logistics of catching a sample, transporting to testing laboratories, conducting a rangefinder, and then setting up a testing with the optimum dilution series, the sample hold times will likely by exceeded. Due to the short duration of these types of discharges, pulling another sample may not be possible.2. In the event that the sample is compromised in anyway during transportation or toxicity tests are inconclusive or invalid, having the opportunity of collecting another sample may not be possible. This is because these discharges are short in duration.3. TCW jobs are performed in stages. The composition of the discharge varies throughout the TCW job. <p><u>The Joint Trades believe</u> that testing the toxicity of the total TCW job constituents would provide EPA with the data needed to assess the toxicity of TCW fluids without the burden of sampling the actual discharge.</p> <p><u>The Joint Trades are also proposing</u> to add clarifying language regarding when and how this information should be reported to EPA Region 6 and clarifying language on Fluid Assessment Information (below).</p>

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				<p>Fluid assessment Information, clarification:</p> <p>3) Type of well treatment or workover operation conducted. The Joint Trades would like clarification on what information and examples regarding the type of well treatment or workover operations conducted EPA is requesting.</p> <p>7 & 8) Clarify if this is the volumes of fluids discharged (not pumped downhole).</p> <p>The draft permit language is more onerous on operators and the additional burden to the O&G Industry does not have any apparent additional protection to the environment.</p>
21	Well Treatment Fluids, Completion Fluids, Workover Fluids – Fluids Commingled with Produced Water Well Treatment Fluids, Completion Fluids, Workover Fluids – Industry – Wide Study Alternative	Part I.B.6.c	<p>“Industry-Wide Study Alternative: Alternatively, operators who discharge well treatment completion and/or workover fluids may participate in an EPA-approved industry-wide study as an alternative to conducting monitoring of the fluids characteristic and reporting information on the associated operations. That study would, at a minimum, provide a characterization of well treatment, completion, and workover fluids used in a representative number of active wells discharging well treatment, completion, and/or workover fluids of varying depths (shallow, medium depth and deep depths). In addition, an approved industry-wide study would be expected to provide greater detail on the characteristics of the resulting discharges, including their nominal chemical composition and the variability of the nominal chemical composition and toxicity. The study area should include a statistical valid representative number of samples of wells located in the Western and Central Areas of the GOM and may include the Eastern Gulf of Mexico (GOM) under the permitting jurisdiction of EPA Region 4, and operators may join the study after the start of and completion of the study date. The study plan should also include interim dates/milestones.</p> <p>A plan for an industry-wide study plan would be required to be submitted to EPA for approval within six months 2 years after the effective date of this permit. Once a permittee has committed financially to participate in the study it shall constitute compliance with the monitoring and reporting requirements of Part I.B.6.c. If the Region does not approve the study plan or a permittee does not sign up to participate in the study, compliance with all the monitoring and reporting requirements for well treatment, completion and workover fluids is required. If the Region approves an equivalent industry-wide well treatment fluids discharge monitoring study, the monitoring conducted under that study shall constitute compliance with these monitoring requirements for permittees who participate in such the industry-wide study. Once approved, the study plan will become an enforceable part of this permit. The study must commence within six months of EPA’s approval. The final study report date is to be determined. The portion which is achievable by March 30, 2022 must be identified in the plan. must be submitted no later than March 30, 2022.”</p>	<p>1. <u>The Joint Trades are requesting</u> that “active” be struck. It is unclear what is intended by “active”, and could, for instance, unintentionally exclude well jobs associated with initial completion and with abandonment. It is enough to simply reference well jobs where TCW fluids will be discharged.</p> <p>2. <u>The Joint Trades request</u> striking “of varying depths (shallow, medium depth and deep depths)” and replacing simply with “discharging well treatment, completion, and/or workover fluids”.</p> <p>Due to the current level of activity, all wells would probably have to be sampled as the jobs arise to ensure compliance with the study window. In other words, the study participants would not have the luxury per se of picking and choosing well TCW jobs to sample. * Therefore, specifying varying depths overly constrains the study from the start. Additionally, it is unclear what EPA means by this term (is it water depth, well depth to reservoir, discharge depth?)</p> <p>* This is the same approach EPA Region VI approved for the recent WBM dissolved metals study i.e. sampling the WBM as each drilling job came along.</p> <p>3. <u>The Joint Trades are requesting</u> changes to the permit language to clarify that a financial commitment to participate in the Industry-Wide Study Alternative satisfies the chronic and acute monitoring requirements and the Well Treatment, Completion, and Workover Reporting Requirements of the permit, and ensure consistency with prior approved industry studies. Further, the change allows the option for new permittees to benefit from the industry-wide study after initiation and completion of the study.</p> <p>4. As stated above <u>the Joint Trades request</u> that TCW toxicity testing be conducted on the total TCW job constituents prepared either by the company performing the job or the toxicity testing laboratory that is representative of all fluids used in the job in lieu of sampling the discharge. The Joint Trades believe that testing the toxicity of the total TCW job constituents would provide EPA with the data needed to assess the toxicity of TCW fluids without the burden of sampling the actual discharge.</p> <p>5. Change the planning time from 6 months to 2 years. The goals and objectives of the proposed TCW characterization are not transparent. To be technically sound, effort should be first focused on a problem formulation phase where diverse set of subject matter experts (SMEs) for various affected organization (e.g., suppliers, operators, Region 6, Region 4, testing laboratories, etc.) come together to clarify the intent, the goals and the objectives of such a study. This should be followed by a data gap analysis</p>

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				<p>and information gathering phase. The working group could then reconvene and consider the findings, identify and resolve how to address the difficult aspects of the study and agree upon how to address the “simpler aspects of the study”. After taking time to consider how to tackle the difficult tasks another meeting could then be convened to reach general agreement on a path forward with the difficult aspects. Though three meetings have been identified, quite possibly more will be needed. Once the problem formulation phase is completed then 6 months for plan development seems reasonable.</p> <p>Depending on what comes out of the problem formulation phase, a hard date of March 30, 2022 may not be realistically achievable for completion and reporting. The portion of the study that is decided by the SMEs, during the problem formulation phase, as reasonable to achieve by March 30, 2022 should be all that is due and can be written into the plan.</p> <p>The draft permit language is more onerous on operators and the additional burden to the O&G Industry does not have any apparent additional protection to the environment.</p>
22	Sanitary Waste (Facilities Continuously Manned for 30 or more consecutive days by 10 or More Persons) - Prohibitions	Part I.B.7.a	<p>“Solids. No floating solids may be discharged to the receiving waters. Observation must be made daily during daylight in the vicinity of sanitary waste outfalls. If floating solids are observed at other times in addition to the daily monitoring, it must be recorded. Observation of floating solids must be recorded whenever floating solids are observed during the day. The number of days solids are observed must be reported.”</p>	<p><u>The Joint Trades are requesting</u> this change to provide clarification with the requirement and for consistency with the requirements outlined in Appendix F, Table 1 of the permit.</p>
23	Sanitary Waste (Facilities Continuously Manned for 30 or more consecutive days by 10 or More Persons) – Limitations	Part I.B.7.b	<p>“Residual Chlorine. Total residual chlorine (TRC) is a surrogate parameter for fecal coliform. Discharge of TRC must meet a minimum of 1 mg/l and shall be maintained as close to this concentration as possible. A grab sample must be taken once per month and the concentration recorded. The approved methods are either Hach CN-66-DPD or EPA method specified in 40 CFR part 136 for TRC.”</p> <p>“[Exception] Any facility operator which properly operates and maintains a marine sanitation device (MSD) that complies with pollution control standards and regulations under section 312 of the Act shall be deemed in compliance with permit prohibitions and limitations for sanitary waste. The MSD shall be tested yearly for proper operation and the test results maintained for three years at the facility or at an alternate site if not practicable.”</p>	<p><u>The Joint Trades request</u> that the exception for the MSD be added back to the permit. The removal of the MSD exception creates an additional burden on the regulated community. The regulated community should be able to demonstrate proper operation and maintenance as required by the permit.</p> <p>The language for TRC limitation “and shall be maintained as close to this concentration as possible” is vague, and <u>the Joint Trades request</u> that it be struck.</p> <p>For MODUs, The US Coast Guard conducts annual inspections of MSDs in order to issue the MODU a Certificate of Compliance. During this inspection, the Coast Guard confirms that the MSD is properly operational and fully functional. Additionally, an overwhelming majority of MODUs are internationally flagged. As such, their Class Society on behalf of Flag State conducts MSD inspections as a requirement for the International Sewage Pollution Prevention Certificate (ISPPC) pursuant to MARPOL, Annex IV [Regulations for the prevention of pollution by sewage from ships].</p> <p><u>The Joint Trades requests</u> that industry be able to demonstrate proper operation and maintenance via maintenance logs/records and any other records of annual inspections by Coast Guard. The monthly TRC requirement increases administrative and financial burden to operators by requiring purchasing additional test kits, training personnel in the use of test kits, and added recordkeeping burden.</p> <p>Additionally, some MODUs have MSDs that do not utilize chlorine as a disinfectant, for example some use bromine biological treatment systems due to reduced usage of chlorine based</p>

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				<p>treatment systems in other parts of the world. <u>The Joint Trades request</u> a similar approach to demonstration of meeting the requirement via US Coast Guard approval, annual inspections, Class/Flag State inspections and/or the ISPPC and maintenance logs/records.</p> <p>The draft permit language is more onerous on operators and the additional burden to the O&G Industry does not have any apparent additional protection to the environment.</p>
24	Sanitary Waste (Facilities Continuously Manned for thirty or more consecutive days by 9 or Fewer Persons or Intermittently by Any Number)	Part I.B.8.a	<p>“Solids. No floating solids may be discharged to the receiving waters. Observation must be made daily during daylight in the vicinity of sanitary waste outfalls. If floating solids are observed at other times in addition to the daily monitoring, it must be recorded. Observation of floating solids must be recorded whenever floating solids are observed during the day. The number of days solids are observed must be reported.”</p> <p>“[Exception] Any facility operator which properly operates and maintains a marine sanitation device (MSD) that complies with pollution control standards and regulations under section 312 of the Act shall be deemed in compliance with permit prohibitions and limitations for sanitary waste. The MSD shall be tested yearly for proper operation and the test results maintained for three years at the facility or at an alternate site if not practicable.”</p>	<p><u>The Joint Trades are requesting</u> this change to provide clarification with the requirement and for consistency with the requirements outlined in Appendix F, Table 1 of the permit.</p> <p>Additionally, <u>the Joint Trades request</u> that the exception for the MSD be added back to the permit. The removal of the MSD exception creates an additional burden on the regulated community. The regulated community should be able to demonstrate proper operation and maintenance as required by the permit.</p> <p>The draft permit language is more onerous on operators and the additional burden to the O&G Industry does not have any apparent additional protection to the environment.</p>
25	Domestic Waste – Monitoring Requirements	Part I.B.9.b	<p>“Solids. No floating solids may be discharged to the receiving waters. Observation must be made daily during daylight in the vicinity of domestic waste outfalls. If floating solids are observed at other times in addition to the daily monitoring, it must be recorded. Observation of floating solids must be recorded whenever floating solids are observed during the day. The number of days solids are observed must be reported.”</p>	<p><u>The Joint Trades are requesting</u> this change to provide clarification with the requirement and for consistency with the requirements outlined in Appendix F, Table 1 of the permit.</p>
26	Miscellaneous Discharges – Discharge List	Part I.B.10.i	<p>(i) Filtered and Slurry: Desalinization Unit Discharge, Diatomaceous Earth Filter Media, Mud, Cuttings, and Cement (including cement tracer) at the Seafloor, and Excess Cement Slurry [Note: Discharges of cement slurry used for testing cement handling equipment are not authorized.]</p>	<p><u>The Joint Trades request</u> that discharges of cement used for testing be authorized by striking this “Note” and adding clarifying language under Miscellaneous Discharges: “Unused Cement Slurry”. Rationale included in Comment No. 30 for Part I.B.10.a.</p> <p>The draft permit language is more onerous on operators and the additional burden to the O&G Industry does not have any apparent additional protection to the environment.</p>
27	Miscellaneous Discharges – Discharge List	Part I.B.10.iv	<p>“(iv) Subsea Discharges: Blowout Preventer Control Fluid, Subsea Wellhead Preservation Fluid, Subsea Production Control Fluid, Umbilical Steel Tube Storage Fluid, Leak Tracer Fluid, Riser Tensioner Fluid, and Pipeline Brine (used as piping or equipment preservation fluids).”</p> <p>“()Blowout Preventer Control Fluid</p>	<p><u>The Joint Trades request</u> that Blowout Preventer Control Fluid discharges not be confined to only the “subsea discharges” re-categorized portion of miscellaneous discharges. OOC requests that Blowout Preventer be categorized as stand alone. This request also provides clarity.</p> <p>Blowout Preventer Control Fluid is discharged subsea, but can also be discharged at the surface (such as when required function tests are being conducted).</p>
28	Miscellaneous Discharges – Discharge List	Part I.B.10 - Notes	<p>“Note 2: Operators must flush and capture the chemicals (e.g., hydrate control fluids or pipeline brine) contained in pipelines, umbilical, or jumpers before or at the time of abandonment.”</p>	<p><u>The Joint Trades request</u> that the proposed language in Part 1.B.10 “Note 2: Operators must flush and capture the chemicals (e.g., hydrate control fluids or pipeline brine) contained in pipelines, umbilical, or jumpers before or at the time of abandonment” be deleted from the text. EPA has reviewed toxicity data and information regarding hydrate inhibitor use submitted by OOC in the past and determined that the hydrate control fluid permit limitations in place in the current permit are appropriate for these types of operations.</p> <p>In Part 1.A.1 under Operations Covered discharges relating to abandonment and decommissioning operations are covered. <i>“This permit establishes effluent limitations, prohibitions, reporting</i></p>

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				<p>requirements, and other conditions on discharges from oil and gas facilities, and supporting pipeline facilities, engaged in production, field exploration, developmental drilling, facility installation, well completion, well treatment, well workover, and <u>abandonment/decommissioning operations</u>.” Discharges of hydrate control fluids (ethylene glycol and methanol) or chemically treated seawater occur during pipeline, umbilical, and jumper decommissioning and installation processes and are covered under the NPDES permit as miscellaneous discharges of hydrate control fluids or chemically treated seawater miscellaneous discharges. Such discharges must comply with the applicable permit limits. After a pipeline or umbilical has been abandoned in place, any leak or spill of hydrate control fluid from that pipeline or umbilical would not be covered under the NPDES permit as stated under Part II Section B.7 “<i>This general permit does not authorize discharges, including spills or leaks, caused by failures of equipment, blowout, damage of facility, or any form of unexpected discharge.</i>”</p> <p>The Joint Trades do not feel any changes to the current permit are necessary to address discharges of hydrate control fluids or chemically treated miscellaneous discharges that occur during pipeline, umbilical, and jumper decommissioning and installation processes. The permit GMG290000 recognizes and authorizes the discharge of hydrate inhibitors in these types of operations as a “Miscellaneous Discharge - Hydrate Control Fluid” (part I.B.10). The permit limit for these discharges is “no free oil” and monitoring required is sheen observations. This provision was added to the permit in the 2004 renewal (69 FR No. 194, p. 60150). Any discharges of methanol greater than 20 bbls or of ethylene glycol greater than 200 bbls within a 7 day period would have to meet the current additional toxicity testing requirements. On April 8, 2011, the OOC Environmental Sub-Committee provided to EPA summary information regarding hydrate inhibitor use in GOM during oil and gas operations at EPA’s request. It addressed the discharge of hydrate inhibitors (methanol, glycol, LDHI, and brine) when disconnecting subsea equipment.</p> <p>On May 7, 2012, the OOC submitted comments on the proposed general permit GMG290000. Attachment A of the comments providing supporting information on the regulation of hydrate inhibitor discharges and included toxicity information on methanol and ethylene glycol. On page 18 of EPA’s Response to Comments dated September, 28, 2012, regarding the draft reissued NPDES permit publicly noticed in the Federal Register on March 7, 2012, EPA in responding to the OOC’s comments in (e), EPA states: <i>Commenter requested that the permit allow discharges of methanol and ethylene glycol less than 200 bbl/d and waive toxicity test requirements for hydrate control fluids. Response: The models were re-run and the concentrations calculated and compared to the NOEC’s for growth and mortality listed for methanol and ethylene glycol in the submitted comment addenda. The modeling runs submitted to justify the 200 bbl/d value, model an exceedance of the NOEC in case 21 of the submitted modeling package for methanol. Further, the actual density of methanol cannot be input to CORMIX. In addition, the subsequent concentrations and possible synergistic effects posed by discharges of produced water and hydrate inhibitors are not substantiated by the comment. Therefore, based on the Agency’s review of the modeling submitted and a suitable margin of safety, the Agency will waive toxicity test requirements for neat methanol less than 20 bbl/d and neat ethylene glycol less than 200 bbl/d. All other hydrate control fluids will meet the requirement of the permit as stated.</i></p> <p>The draft permit language is more onerous on operators and the additional burden to the O&G Industry does not have any apparent additional protection to the environment.</p>
29	Miscellaneous Discharges – Discharge List	Part I.B.10 - Notes	“(vii) Non-specified Discharges: Any discharge that is not specified in this permit is not authorize.”	<p>The Joint Trades request the additional language be added to the permit.</p>

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			<p>Add to this section:</p> <p>“Small quantity discharges not addressed elsewhere in this permit, may be discharged after a notification to EPA that includes the following:</p> <ul style="list-style-type: none"> Proposed date(s) of activity Description of activity (e.g., connection of flowline to structure) Expected materials and quantities to be discharged Description of potential impacts on the environment” 	<p>There are activities that might result in a small quantity discharge to enter the water. Many times, the quantities are hard to estimate and are very small, but however there doesn’t appear to be method for these to be reported or addressed under the permit.</p> <p>Potential activities included but are not limited to:</p> <ul style="list-style-type: none"> Application of materials subsea that might migrate into the receiving waters (e.g., connector fluid/gel to ensure proper connections to minimize possible discharge of operational or production fluids). Non-oil materials that migrate from a line when being connected to another part of the structure. An example is connecting a (preserved) flowline to a tree. The removal of a cap may result in the inadvertent mixing of contents of the wet-parked line with the ambient water of the receiving water. <p>Not accepting the proposed permit language is onerous on operators and an additional burden to the O&G Industry with no apparent additional protection to the environment.</p>
30	Miscellaneous Discharges – Unused Cement	Part I.B.10.a	<p>“Unused Cement Slurry - Unused cement slurry due to equipment failure during the cementing job – such discharges are limited to once per cementing job .calendar year per facility. Unused cement slurry due to off specification during the cementing job – such discharges are limited to one discharge per well. In either case, The operator shall report date, identification of well or facility, volume of cement, and cause of the discharge in their NetDMR.”</p> <p>“Unused Cement Slurry - Unused cement slurry due to equipment failure during the cementing job – such discharges are limited to once per cementing job .calendar year per facility. Unused cement slurry due to off specification during the cementing job – such discharges are limited to one discharge per well. In either case, The operator shall report date, identification of well or facility, volume of cement, and cause of the discharge in their NetDMR.”</p>	<p>1. <u>The Joint Trades support</u> the addition of unused cement slurry as a new discharge under Miscellaneous Discharges: “Unused Cement Slurry”. <u>The Joint Trades propose</u> that the definition below be added to Part II.G. The addition of these discharges is critical to mitigating well control issues if the cement system cannot be returned to service quickly.</p> <p><i>“Unused cement slurry- cement slurry used for testing of equipment or resulting from cement specification changes or equipment failure during the cementing job.”</i></p> <p>Summarizing the details of OOCs recent submittals to EPA Region VI related to this issue are as follows:</p> <ul style="list-style-type: none"> a) Equipment testing is critical to proper operation and maintenance of drilling systems. Without adequate testing, well control concerns (among others) can arise. Equipment that is not properly tested has the potential for a catastrophic environmental event. EPA must consider equipment testing/commissioning as “proper operation and maintenance” since if permittees do not test/commission equipment then a permittee cannot truly say that they are complying with this permit requirement, b) The discharge of such fluids would meet all monitoring and limitations of the permit for those fluid types, and since such fluids had not been used” they would have a lower pollutant potential than the used fluids (which are authorized for discharge), c) Prior EPA determinations have been received which authorized such discharges (and the draft fact sheet does not now provide a substantive justification for now prohibiting such discharges), and d) Authorizing discharge will avoid substantive safety risks for managing bulk fluids back to shore including lifting large, heavy containers at sea; transportation risks at sea and on-land and; tank/container cleaning associated with solidified cement (It is difficult to inhibit cement from setting up. Therefore, transport to shore is expected to be solidified blocks in their containers). This also consumes limited onshore disposal facility capacity for essentially benign materials. Finally, the transport of these materials will involve environmental consequences including increased air emissions from marine and road transport.

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				<p>The Joint Trades present here additional information on the discharge quantities to support approval of these discharges. The following are typical volumes of cement for the subject issue:</p> <ol style="list-style-type: none">1. New drilling units (MODU or platform rig) commissioning/equipment testing: 100-200 bbls per ship. This is slurry used to test pumping functions and verify flow paths. Assuming 3-7 newly constructed drilling units per year enter the Gulf (1), this is equivalent to 600-1400 bbl/yr of slurry that may be discharged annually.2. Other Discharges of Unused Cement Slurry<ul style="list-style-type: none">○ Repairs: when a cement system malfunctions or equipment must be upgraded or changed out for specific job, the existing cement must be removed, repairs made and testing conducted to ensure proper operation. There are two concerns in this case with a prohibition against the discharge:<ul style="list-style-type: none">○ If the malfunction occurs during a cementing job, the existing cement must be washed out quickly (before it sets), the repair made, the testing performed and then new cement mixed. Discharge is the most effective means to support rapid repair since typically weight and space constraints prevent holding empty containers offshore for such a contingency. This can involve potential well control issues if the cement system cannot be returned to service quickly.○ More generally, even if no cement job is in progress, the testing after repair is critical to assure all systems work as designed and provide cement that can comply with well design requirements. <p>Estimated volumes are 5-100 bbls per event. The Joint Trades estimate this occurrence is rare on a per rig basis. In 2012, a high activity year, there were ~ 99 rigs working in the GOM (2) (as of June 23, 2017 there were only 22 rigs active in the GOM). Using the 2012 rig count and assuming one event per year per rig this equates to ~500-10,000 bbls/year of slurry discharged.</p> <ul style="list-style-type: none">○ Cement not meeting the specifications for a well job: 20-100 bbls. OOC expects this to also be a rare occurrence. Note- if this occurs when a well is in a productive interval, the cement must be washed out of the unit to prevent setting. Then a new batch needs to be quickly mixed to prevent well control issues. Discharge is the most effective means to support rapid response since typically weight and space constraints prevent holding empty containers offshore for such a contingency. This can involve potential well control issues if the cement system cannot be returned to service quickly <p>A review of BOEM data (3, 4) indicate > 100 wells per year are drilled in the Gulf during high activity cycles. Assuming one event per well per year yields 2000-10,000 bbls/yr of slurry discharged.</p> <p>In summary, annual expected discharges of the proposed “Unused Cement Slurry” could be on the order of:</p> <p>Commissioning of new drilling units s= 600-1400 total bbls/year Repairs= 500-10,000 total bbls/year <u>Off spec cement 2000-10,000 total bbls/year</u></p>

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				<p>Total= 3100 - 21,400 total bbl/year</p> <p>Compare this to a single well's discharge of authorized Excess Cement Slurry (as authorized and defined in the permit): though highly variable depending on many factors, this is on the order of approximately 100-400 bbls (including pit cleanouts after a job). The majority of this is associated with riserless operations.</p> <p>Assuming 100 wells/year are drilled in the Gulf, this yields approximately 10,000-40,000 bbls of Excess Cement Slurry already authorized by the current permit (and continued for authorization in the proposed permit) for discharge. The volumes shown above for the proposed Unused Cement Slurry are of the same order of magnitude as existing authorized excess cement slurry discharges (and are probably lower). Given this, and typical discharge at or near the surface with immediate dispersion into the water column, the environmental impacts are expected to be insignificant.</p> <p>As an alternative, <u>the Joint Trades request</u> a joint industry study be performed to assess the overall environmental and safety impacts of this discharge to better inform the decision before considering a prohibition, in the next permit cycle.</p> <p><u>References</u></p> <ol style="list-style-type: none">1. Personal communication, Kuehn – Rigzone, 4/23/12.2. Rigzone- Rig Report: Offshore Rig Fleet by Region http://www.rigzone.com/data/rig_report.asp?rpt=reg3. http://www.boem.gov/uploadedFiles/BOEM/Newsroom/Offshore_Stats_and_Facts/Gulf_of_Mexico_Region/OCSDrilling.pdf4. http://www.gomr.boemre.gov/PDFs/2009/2009-016.pdf <p>2. <u>The Joint Trades request</u> that Unused cement frequencies included: “such discharges are limited to per calendar year per facility” and “one discharge per well” should be removed and the statement should read,</p> <p><i>Unused Cement Slurry - Each type of unused cement slurry discharge is limited to once per cementing job. The operator shall report date, identification of well or facility, volume of cement, and cause of the discharge in their NetDMR.</i></p> <p>The language proposed in the draft is overly burdensome and introduces complexity for tracking and assuring compliance with a once per facility and once per well limitation. These restrictions may also limit the operator from mitigating well control issues if the cement system cannot be returned to service quickly during each cementing job. Each facility has multiple wells flowing to it and each well may require multiple cementing jobs.</p> <p>The draft permit language is more onerous on operators and the additional burden to the O&G Industry does not have any apparent additional protection to the environment.</p>

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31	Miscellaneous Discharges of Seawater and Freshwater which have been chemically treated	Part I.B.11	<p>Revise and reword section as follows:</p> <p>Excess seawater which permits the continuous operation of fire control and utility lift pumps, Excess seawater from pressure maintenance and secondary recovery projects, Water released during training of personnel in fire protection, SeaWater used to pressure test piping and pipelines, Ballast water, Once through non-contact cooling water, SeaWater used as piping or equipment preservation fluids, and SeaWater used during Dual Gradient Drilling.</p> <p>Water includes both seawater and freshwater discharges.</p>	<p><u>The Joint Trades request</u> that a change be made to the Title and list for “Miscellaneous Discharges of Seawater and Freshwater which have been chemically treated”. This will be a word change from “Seawater” and “Freshwater” to “Water”. This change will ensure that both “Seawater” and “Freshwater” are included in the chemically treated discharge list.</p> <p>Not accepting the proposed permit language is onerous on operators and an additional burden to the O&G Industry with no apparent additional protection to the environment.</p>
32	Miscellaneous Discharges of Seawater and Freshwater which have been chemically treated - Limitations	Part I.B.11.a	<p>“a. Limitations</p> <p>Treatment Chemicals. The concentration of treatment chemicals in discharged seawater or freshwater shall not exceed the most stringent of the following three constraints:</p> <ol style="list-style-type: none"> 1) the maximum concentrations and any other conditions specified in the EPA product registration labeling if the chemical is an EPA registered product 2) the maximum manufacturer's recommended concentration 3) 500 mg/l <p>[Note: The above concentration limits are based on each constituent that make up the treatment chemical in the discharge.]</p>	<p><u>The Joint Trades request</u> the addition of the note to provide clarification that the chemical concentration limits are based on each constituent that make up the treatment chemical in the discharge.</p> <p>Additionally, <u>the Joint Trades request</u> EPA provide clarification regarding the following related to “Treatment Chemical Concentration” :</p> <ul style="list-style-type: none"> • What if a treatment chemical degrades over time or is reacted away (e.g., acid, biocide) before discharge occurs? Would the discharge be considered as chemically treated? <p>Not accepting the proposed permit language is onerous on operators and an additional burden to the O&G Industry with no apparent additional protection to the environment.</p>
33	Miscellaneous Discharges of Seawater and Freshwater which have been chemically treated - Limitations	Part I.B.11.a	<p>“[Note: Discharges treated by bromide, chlorine, or hypochlorite or which contain only electrically generated forms of chlorine, hypochlorite, copper ions, iron ions, and aluminium ions are not required for toxicity tests.]”</p>	<p><u>The Joint Trades request</u> revising the text to include copper, iron, and aluminium ions to account for the fact that not only is electric current used to generate active chlorine from seawater, but also there are systems which use sacrificial anodes to generate other anti-biofouling ions (such as, iron, copper and aluminium). Examples of several systems and related information can be found at the following links:</p> <p>http://www.farwestcorrosion.com/cathelco-marine-pipework-anti-fouling-systems-for-fpsos.html</p> <p>https://cathodicme.com/mgps-systems/marine-growth-prevention-system/</p> <p>http://www.cathelco.com/mgps-overview/how-a-marine-growth-prevention-system-works/</p> <p>http://www.blumeworldwideservices.com/</p> <p>Additionally, the Joint Trades are providing a current Copper Ion system installation and maintenance document in use (see attachment Appendix B).</p> <p><u>The Joint Trades do not expect</u> the discharge will have a toxic impact on the environment as these systems operate in the part per billion concentration range. It is also noted that these</p>

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				<p>systems are in use in the marine industry. Based on review of the manufacturer information, these systems operate with a copper in solution of less than 2 ppb. At less than 2 ppb in solution, a 100% effluent discharge would have a copper concentration that is lower than that of the EPA marine chronic and acute criteria. When compared using the existing critical dilutions and NOECs from recent testing, the copper concentration is even lower than at 100% effluent discharge and thus would be lower than the EPA marine chronic and acute criteria.</p> <p>Further, it should be noted that there is no marine water quality criteria for Aluminium. However, it is expected that the concentration of aluminium in solution will be less than the copper concentration, based on manufacturer information.</p> <p><u>The Joint Trades are submitting</u> toxicity testing information to support no toxic impact from these systems. Data collected from electric current generated ion treated seawater discharges under current general permits GEG460000 and GMG290000 demonstrate no reasonable potential for toxicity at the critical dilution and should be excluded from the monitoring requirement. These data include electric current generated copper, iron and aluminium ions and are hereby submitted as Appendix C.</p> <p><u>Additionally, the Joint Trades are requesting</u> this change be made to be consistent with the Draft Region 4 permit GEG4600000. This permit includes the exemption for electrically generated forms of chlorine, hypochlorite, copper ions, iron ions, and aluminium ions.</p> <p><i>Ref.: Notice of Proposed National Pollutant Discharge Elimination System (NPDES) General Permit for New and Existing Sources in the Offshore Subcategory of the Oil and Gas Extraction Category for the Eastern Portion of the Outer Continental Shelf (OCS) of the Gulf of Mexico (GEG460000), Public Notice No. 16AL00001.</i></p> <p>Not accepting the proposed permit language is onerous on operators and an additional burden to the O&G Industry with no apparent additional protection to the environment.</p>
34	Miscellaneous Discharges of Seawater and Freshwater which have been chemically treated – Monitoring Requirements	Part I.B.11.b	<p>“Flow Volume. Once per quarter-month, an estimate of total flow (bbl/day) volume of discharges (bbl) during the quarterly reporting period must be reported recorded. (The operator shall keep records of discharge events.)”</p>	<p><u>The Joint Trades request</u> clarification on the reason for the change of Chemically Treated Miscellaneous Discharge volume from highest “Monthly Average per monitoring period” (quarter) to “Total volume per quarter” when all other permit requirements for chemically treated volume (i.e. frequency and critical dilution) remain and are based on “highest monthly average”.</p> <ul style="list-style-type: none">• Discharge volume reported on toxicity lab reports currently reflects the volumes needed to determine critical dilution and frequency of testing, providing a clear record of why the test was conducted at the frequency and applicable critical dilution (as determined by the current required volume limitations).• Keeping track of two different types of measurements could potentially cause confusion and possibly result in testing done at an incorrect frequency or critical dilution.• This reporting requirement has not changed since Chemically Treated Miscellaneous Discharge requirements were added to the permit in 1998.• And historically, the discharge volume reporting requirement has remained the “highest monthly average” for all discharges requiring volume reporting (and toxicity testing). <p><u>The Joint Trades request</u> that the proposed change to chemically treated volume reporting not be incorporated into the reissued permit and remain as stated in the current permit.</p>

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				The draft permit language is more onerous on operators and the additional burden to the O&G Industry does not have any apparent additional protection to the environment.								
35	Cooling Water Intake Structure Requirements – Information Collection	Part I.B.12.a.1	“New fixed facilities must have submit source water baseline biological characterization data, source water physical data, cooling water intake structure data, and velocity information:”	<p>The Joint Trades are requesting this change to provide consistency with the first sentence found under Part 1.B.12.a and Section VII.E of the proposed Fact Sheet.</p> <p>Part I.B.12.a states “<i>The owner or operator of a new offshore oil and gas extraction facility must <u>retain</u> [emphasis added] the following information with the facility and make it available for inspection.</i>” .</p> <p>Section VII.E of the proposed Fact Sheet states “<i>EPA also proposes to reduce application information collections from new facilities as identified in the current permit Part I.B.12.a. Instead of submitting such information to EPA, the new facility operator shall keep those information (either paper or electronic document) accessible for inspection. The operator of new facility still shall report basic information, such as facility location, design intake capacity, and intake velocity, in NOI as required in permit Part I.A.2, but shall keep the records of details and all calculations or drawings with the facility and make it available for inspection. New facilities which have any intake structure with a designed intake velocity greater than 0.5 ft/sec are not authorized to discharge cooling water under this permit.</i>”</p> <p>The draft permit language is more onerous on operators and the additional burden to the O&G Industry does not have any apparent additional protection to the environment.</p>								
36	Cooling Water Intake Structure Requirements – Velocity Monitoring Requirements	Part I.B.12.c.1.ii Part I.B.12.c.2.iii Part I.B.12.c.3.ii	<p>Part I.B.12.c.1.ii “ii. Velocity monitoring. The operator must monitor intake flow velocity across the intake screens to ensure the maximum intake flow velocity does not exceed 0.5 ft/s. The intake flow velocity shall be monitored daily quarterly if the most recently reported intake flow velocity is less than 0.30 ft/s; monthly if the most recently reported intake flow velocity is 0.30 to 0.38 ft/s; and daily if the most recently reported intake flow velocity exceeded 0.38 ft/s. A downtime, up to two weeks, for periodic maintenance or repair is allowed and must be reported in the DMRs. When replacement parts cannot be obtained within the two-week time period, the down time can be extended in increments of two weeks until the replacement parts or equipment can be obtained by the facility. In addition to the initial two-week downtime allowance, each additional two-week increment for downtime must be reported in the DMRS indicating reasons why the additional increment(s) was needed.”</p> <p>Part I.B.12.c.2.iii “iii. Velocity monitoring. The operator must monitor intake flow velocity across the intake screens to ensure the maximum intake flow velocity does not exceed 0.5 ft/s. The intake flow velocity shall be monitored daily quarterly if the most recently reported intake flow velocity is less than 0.30 ft/s; monthly if the most recently reported intake flow velocity is 0.30 to 0.38 ft/s; and daily if the most recently reported intake flow velocity exceeded 0.38 ft/s. A downtime, up to two weeks, for periodic maintenance or repair is allowed and must be reported in the DMRs. When replacement parts cannot be obtained within the two-week time period, the down time can be extended in increments of two weeks until the</p>	<p>The Joint Trades are requesting a tiered approach to velocity monitoring versus the current daily monitoring requirement. Namely,</p> <table><tr><th>If the Most recent intake flow velocity (ft/s)</th><th>Then Monitoring Frequency Should be</th></tr><tr><td><0.300</td><td>Quarterly</td></tr><tr><td>0.300 – 0.38</td><td>Monthly</td></tr><tr><td>>0.38</td><td>Daily</td></tr></table> <p>Velocity monitoring consists of a demonstration requirement based on the facilities’ proposed design and a compliance monitoring requirement that verifies the velocity limitation is being met. There is agreement with the purpose of inspection, but not the frequency.</p> <p>The tiered velocity monitoring approach is based upon a statistical analysis of six separate CWIS operated in the GOM during 2015. The analysis is based on the rate-of-change in daily velocity monitoring data (attached as Appendix D). An ANOVA indicates no statistical difference in the rate of change in intake velocity among the five intakes (P < 0.05). The data are approximately normally distributed with a mean change in velocity equal to 0.0001 (ft/s)/day and a standard deviation equal to 0.0106 (ft/s)/day. Based on these data, there is a 95% probability that the mean velocity increase over any 30-day period will be less than 0.11 (ft/s)/day; and a 95% probability that the mean velocity increase over any 90-day period will be less than 0.20 (ft/s)/day. Therefore, 95% of all monthly intake velocity measurements will be less than 0.5 ft/s provided that the previous month’s velocity measurement was less than 0.39 ft/s. Similarly, 95% of all quarterly velocity measurements will be less than 0.5 ft/s provided that the previous quarter’s measurement was less than 0.30 ft/s.</p>	If the Most recent intake flow velocity (ft/s)	Then Monitoring Frequency Should be	<0.300	Quarterly	0.300 – 0.38	Monthly	>0.38	Daily
If the Most recent intake flow velocity (ft/s)	Then Monitoring Frequency Should be											
<0.300	Quarterly											
0.300 – 0.38	Monthly											
>0.38	Daily											

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			<p>replacement parts or equipment can be obtained by the facility. In addition to the initial two- week downtime allowance, each additional two-week increment for downtime must be reported in the DMRS indicating reasons why the additional increment(s) was needed.”</p> <p>Part I.B.12.c.3.ii “ii. Velocity monitoring. The operator must monitor intake flow velocity across the intake screens to ensure the maximum intake flow velocity does not exceed 0.5 ft/s. The intake flow velocity shall be monitored daily quarterly if the most recently reported intake flow velocity is less than 0.30 ft/s; monthly if the most recently reported intake flow velocity is 0.30 to 0.38 ft/s; and daily if the most recently reported intake flow velocity exceeded 0.38 ft/s. A downtime, up to two weeks, for periodic maintenance or repair is allowed and must be reported in the DMRs. When replacement parts cannot be obtained within the two-week time period, the down time can be extended in increments of two weeks until the replacement parts or equipment can be obtained by the facility. In addition to the initial two -week downtime allowance, each additional two-week increment for downtime must be reported in the DMRS indicating reasons why the additional increment(s) was needed.”</p>	<p>We note this data makes sense relative to visual inspection information presented elsewhere- the rate of biogrowth on intakes is quite low and so the rate of change of intake velocity would also be expected to be quite low, hence allowing for reduced monitoring frequencies (using a tiered approach to ensure compliance with the 0.5 fps standard for any CWIS design).</p> <p>Further, <u>the Joint Trades are requesting</u> the additional language be included to account for times when replacement parts and equipment cannot be obtained from a manufacturer in a two-week time frame. Sometimes these items are on backorder and require additional time to receive.</p> <p>The draft permit language is more onerous on operators and the additional burden to the O&G Industry does not have any apparent additional protection to the environment.</p>																
37	Cooling Water Intake Structure Requirements – Entrainment Monitoring Requirements	Part I.B.12.c.2.ii	<p>ii. The permittee must submit a SEAMAP data report annually to meet the requirements of 40CFR125.137. Entrainment monitoring/sampling. The operator must collect 24-hour entrainment samples from water withdrawn at all CWISs at the following frequency and duration based on the depth of the intake structure:</p> <table><tr><td>Intake Screen or Opening Locates Below Water Surface</td><td><= 100 Meters (M)</td><td>>100 M, but <= 200 M</td><td>>200 M</td></tr><tr><td>Frequency</td><td>Three samples per Year</td><td>Two Samples per Year</td><td>One Sample per Year</td></tr><tr><td>Months</td><td>March or April, and June, and December</td><td>March and April and June</td><td>March and April</td></tr><tr><td>Reporting</td><td colspan="3">Entrainment per Sample Event and Total Annual Entrainment</td></tr></table>	Intake Screen or Opening Locates Below Water Surface	<= 100 Meters (M)	>100 M, but <= 200 M	>200 M	Frequency	Three samples per Year	Two Samples per Year	One Sample per Year	Months	March or April, and June, and December	March and April and June	March and April	Reporting	Entrainment per Sample Event and Total Annual Entrainment			<p><u>The Joint Trades strongly objects</u> to the continued requirement to conduct ongoing entrainment monitoring.</p> <p><u>The Joint Trades request</u> the removal of entrainment monitoring/sampling requirement and the addition of language requiring permittees to submit a SEAMAP data report annually.</p> <p>40 CFR 125.137.a.3 provides the Director the flexibility to reduce the frequency of monitoring following 24 months of bimonthly monitoring provided that “seasonal variations in species and the numbers of individuals that are impinged or entrained” can be detected. The report on the 24 month industry entrainment study (1) documents that many important Gulf of Mexico species were not detected at all in the regions where new facilities are expected to be installed so that entrainment impacts on these species will be zero; (2) provided documentation on the seasonal dependence of species and number of eggs and larvae available for entrainment, and (3) concludes that anticipated entrainment will have an insignificant impact on fisheries in any season; the Joint Trades believes that the intent of 40 CFR 125.137 has effectively been met and that the requirement for ongoing entrainment monitoring can be removed.</p> <p>Our request is based on the results of the results of the recently completed Gulf of Mexico Cooling Water Intake Structure Entrainment Monitoring Study and reinforced by the quarterly entrainment monitoring reports by individual operators (attached as Appendix E). Industry believes that these results warrant removal of the entrainment monitoring/sampling because (a) the study showed that no meaningful impacts from entrainment are expected; (b) no meaningful impact was found, therefore, the seasonality of the impact is a moot point; (c) the SEAMAP database provides a continually-updated source of information that is functionally equivalent to permit-required monitoring for the purpose of estimating entrainment impacts.</p> <p>The following is a brief summary of key findings of the industry entrainment monitoring study:</p>
Intake Screen or Opening Locates Below Water Surface	<= 100 Meters (M)	>100 M, but <= 200 M	>200 M																	
Frequency	Three samples per Year	Two Samples per Year	One Sample per Year																	
Months	March or April, and June, and December	March and April and June	March and April																	
Reporting	Entrainment per Sample Event and Total Annual Entrainment																			

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				<p>1. Study results provide data for enumeration of entrainment losses by species and for total egg and larval losses as required by the Permit.</p> <p>2. Estimated entrainment impacts on ichthyoplankton are insignificant.</p> <p>A. Entrainment monitoring/sampling is required during the primary period of reproduction, larval recruitment, and peak abundance for each species, specifically, identified as part of the Source Water Biological Baseline Characterization Study (SWBBCS); however, the SWBBCS found no evidence to suggest CWIS would impact selected species of socioeconomic and ecological importance.</p> <p>B. In this study, catches of SWBBCS selected species were too low to statistically model (all exhibited >90% zeroes across tows; some 100% zeroes).</p> <p>C. Thus, no meaningful impacts from entrainment on these species are expected to occur.</p> <p>D. Daily entrainment was extremely small compared to the corresponding daily reference abundances drifting past each facility; thus, no meaningful impacts are expected for any species.</p> <p>3. Temporal and environmental influences on ichthyoplankton densities.</p> <p>A. While no impacts are expected to occur at any intake depth, the most prevalent influence was sampling depth, whereby densities declined exponentially with increasing depth.</p> <p>B. In general, the lowest densities occurred during the fall and greatest densities during the spring.</p> <p>4. Using SEAMAP data to estimate entrainment loss.</p> <p>A. Ichthyoplankton densities also declined exponentially with total water column depth; all study sites were deeper than the shallower depths (about ≤ 200 m) where sharp increases in densities began in the shoreward direction.</p> <p>B. For each of the study sites and across months, forecasted densities based on SEAMAP data were consistently 1½ to 2 times greater than those observed during this study.</p> <p>C. No impacts are expected based on densities estimated from either dataset.</p> <p>D. Thus, SEAMAP data appear adequate for future estimates of impacts on the ichthyoplankton community.</p> <p>The results of recent quarterly on-platform entrainment monitoring studies conducted (attached as Appendix E) are fully consistent with the results of the Entrainment Monitoring Study. The concentrations of larvae of key socioeconomic and ecological important species were typically zero in these measurements. This is consistent with industry's views that (1) cooling water</p>

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				<p>intake structures on offshore facilities present an insignificant risk to fisheries, (2) the quarterly monitoring requirement is providing no new useful information and (3) the requirement should be dropped entirely.</p> <p>Platform-specific monitoring in the Gulf of Mexico shows that data collected from actual cooling water systems indicates that fish egg and larval concentrations are equivalent to or much lower than those in the SEAMAP database for the same fishery zones (See Appendix F).</p> <p><u>The Joint Trades believe</u> that a requirement for periodic reports based on the updated SEAMAP database are appropriate to the risk as demonstrated in the SWBBCS and entrainment monitoring studies. Using the SEAMAP database for entrainment risk assessment is actually preferable to platform specific monitoring because:</p> <ul style="list-style-type: none">• Data are collected and maintained over the long term, using consistent methodology for all sites, ensuring comparability of data over time• The existing SEAMAP database already provides an assessment of seasonality of entrainment risk (as required by 40CFR125.137) which can be periodically updated as new data are added to detect changes in risk over time.• SEAMAP larval data could be selected for most common species in each region• Approach is cost effective and appropriate to the low level of risk demonstrated in the 24-month Entrainment Monitoring Study and in a peer-reviewed study of entrainment risk from much larger water volumes in depths of 20-60 m where egg and larval densities are much higher.* <p>*Gallaway, B.J., W.J. Gazey, J.G. Cole, and R.G. Fechhelm (2007); "Estimation of Potential Impacts from Offshore Liquefied Natural Gas Terminals On Red Snapper and Red Drum Fisheries of the Gulf of Mexico: An Alternative Approach" Transactions of the American Fisheries Society (2007) 136:655-677</p> <p>Given this finding, use of existing SEAMAP system for monitoring entrainment is a much more comprehensive, cost-effective mechanism for gauging the seasonality of entrainment potential over time. Such SEAMAP reporting could be done by the Agency's review of this data set or by a permit requirement for industry to submit annual reports on the SEAMAP data.</p> <p><u>Although striking this requirement in its entirety is the Joint Trades' preference</u>, should EPA Region VI continue to insist on platform entrainment monitoring, <u>The Joint Trades are requesting</u> that the entrainment monitoring be no longer required after two years' entrainment data demonstrates the number of entrained species is lower or close to SEAMAP data.</p> <p>Suggested alternate wording would be:</p> <p><i>"Facilities with two years of entrainment data demonstrating that the number of entrained species is lower or close to SEAMAP data are no longer required to conduct entrainment monitoring. Permittees shall submit a certification that the entrainment data is less than or close to SEAMAP data prior to discontinuing entrainment monitoring."</i></p>

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				The draft permit language is more onerous on operators and the additional burden to the O&G Industry does not have any apparent additional protection to the environment.
38	Other Discharge Limitations – Floating Solids or Visible Foam	Part I.C.1	“Floating Solids or Visible Foam or Oil Sheen ”	<p><u>The Joint Trades are requesting</u> the deletion of “or Oil Sheen” from this section. The deletion is requested for the following reasons:</p> <ul style="list-style-type: none"> • The permit already restricts oil sheens from discharges through the various requirements for no “Free Oil”. • Section 311 of the Clean Water Act prohibits the discharge of oil. • Listing “Oil Sheen in the title of this part leads to confusion on the intent of the part. <u>The Joint Trades believe</u> it was not the intent to allow the discharge of “trace amounts” of oil and/or oil sheen. <p>Not accepting the proposed permit language is onerous on operators and an additional burden to the O&G Industry with no apparent additional protection to the environment.</p>
39	Other Discharge Limitations – Dispersants, Surfactants, and Detergents	Part I.C.3 And Part I.B.4.a	<p>Part I.C.3</p> <p>“The discharge of dispersants, surfactants, and detergents is prohibited except when it is incidental to their being used to comply with safety requirements of the Occupational Safety and Health Administration and the Bureau of Safety and Environmental Enforcement.”</p> <p>Part I.B.4.a</p> <p>“The addition of dispersants or emulsifiers to produced water discharges is prohibited when used for purposes that could circumvent the intent of the permit’s produced water sheen monitoring requirements. 40 CFR 5.110.4.”</p>	<p><u>The Joint Trades agree</u> with the comments in VII.J on pages 26 and 27 of the fact sheet that surfactants should not be added to the produced water discharge to prevent detection of a sheen on the receiving water and circumvent the permit’s produced water sheen monitoring requirements. However, the Joint Trades are concerned that the proposed changes to the permit language regarding the discharge of dispersants, surfactants, and detergents may have unintended prohibitions on the use of surfactants (detergents, dispersants) in the context of the use of surface active substances in the formulation of chemicals used in the offshore oil and gas industry to impart specific properties to the formulations (see attached document Surfactants in Oil & Gas Drilling provided as Appendix G and also API’s Offshore Effluent Guidelines Steering Committee paper Chemical Treatments and Usage in Offshore Oil and Gas Production Systems, Hudgins, October 1989) (attached as Appendix A).</p> <p><u>The Joint Trades recommend</u> keeping the current permit language in Section I.C.3.</p> <p><u>The Joint Trades request</u> the changes to the proposed language in Part I.B.4.a as noted in the proposed red text. See Comment No. 8 for additional information and discussion on this requested change.</p>

Comment No.	Type/Category	Permit Section Ref.	Current or Revised Permit Language /Clarifications/Issue	Rationale
				The draft permit language is more onerous on operators and the additional burden to the O&G Industry does not have any apparent additional protection to the environment.
40	Spill Prevention Best Management Practices	Part II.B.7	<p>“This general permit does not authorize discharges, including spills or leaks, caused by failures of equipment, blowout, damage of facility, or any form of unexpected discharge. If a permittee seeks a conditional exemption to the discharge restrictions of this permit, the permittee must demonstrate to the Regional Administrator the potential environmental impacts and/or benefits of the proposed discharge. Approval from the Regional Administrator must be obtained prior to commencement of such discharge and the Regional Administrator will establish appropriate discharge limitations based upon the evidence provided by the permittee.”</p>	<p><u>The Joint Trades request</u> adding the suggested language in red text to provide a mechanism for EPA to approve unique and novel discharges that may not be covered by the existing permit conditions, but may be necessary for a variety of operational reasons. By adding the attached language, a permittee and EPA can evaluate such situations based on sound science and information. EPA can then make an appropriate decision after completing a review.</p> <p>Not accepting the proposed permit language is onerous on operators and an additional burden to the O&G Industry with no apparent additional protection to the environment.</p>
41	Reporting Requirements - Discharge Monitoring Reports (DMR) and Other Reports	Part II.D.4	<p>“If for some reason the electronic submittal is not accepted or the NetDMR system is not available, the permittee would be required to submit the paper DMR. The permittee has up to 60 days to submit paper DMRs. “NOTE: As soon as NetDMR is available, the permittee must file their DMRs electronically. The paper DMRs serve as evidence the permittee attempted to meet their submission deadline when NetDMR was not available. The evidence will be the mail receipt (e.g., FedEx, UPS, USPS, etc.) showing EPA received the paper DMRs.”</p> <p>“Operators shall mail all paper DMRs and all paper DMR attachments to the following address: Water Enforcement Branch (6EN-WC) U.S. Environmental Protection Agency Region 6 1445 Ross Avenue Dallas, TX 75202”</p> <p>“Instructions for completing DMRs in accordance with the permit requirements are available in EPA Region 6’s website at http://www.epa.gov/region6/6en/w/offshore/home.htm.”</p> <p>“Other required reports shall be submitted electronically with NetDMR. EPA may request a paper copy of any report in addition to the electronic report.”</p> <p>“If discharge is not applicable for a facility, "no discharge" must be reported for that facility* until an NOI is submitted. “</p>	<p><u>The Joint Trades are requesting</u> the additional language to:</p> <ul style="list-style-type: none"> • Provide clarity when the NetDMR system is not available • Provide an official address for submittal of the paper DMRs. <p>Additionally, <u>the Joint Trades are requesting</u> a set of instructions for completing DMRs in accordance with the requirements of the permit the effective date of the permit. The instructions should utilize the permit requirements first and provide clarification when there are limitations or input variables with the electronic system and DMRs. The Joint Trades cannot stress the importance that the instructions and DMR be built around the permit requirements and not vice versa. The permit requirements are what an operator is held accountable to and not the limitations and data inputs of the electronic system. These detailed instructions would eliminate multiple DMR errors and create more consistency and should eliminate most of the BSEE inspector’s questions and confusion during offshore inspections.</p> <p>The instructions should include information on DMR reporting during the transition of coverage from the 2012 permit to the new 2017 permit. An operator has 90 days from the effective date to submit an NOI for coverage of existing permit coverage under the 2012 permit. It is unclear which timeframe and how to properly report on DMRs between each permit once a NOI is submitted within the 90 days for coverage under the new permit.</p> <p>Since the NetDMR system encompasses many different permit types, not all of the No Data Indicator Codes (NODI) are applicable to the Region 6 DMRs. Therefore, <u>the Joint Trades are requesting</u> the instructions also include guidance and clarification on which NODI codes are applicable and in what context they should be used in accordance with the permit requirements.</p> <p><u>The Joint Trades request</u> the ability to review and comment on the DMR instructions prior to them being finalized to allow for clarification and edits as necessary.</p> <p><u>The Joint Trades are requesting</u> that the DMR be corrected to reflect the correct permit requirements outlined in the permit for each parameter. The current DMR contains numerous typos and inconsistencies with the permit requirements. OOC has outlined several of these in the attachment provided in Appendix H.</p> <p><u>The Joint Trades are also correcting</u> a typo that was found in the last sentence.</p>

Comment No.	Type/Category	Permit Section Ref.	Current or Revised Permit Language /Clarifications/Issue	Rationale
				The lack of active website, email address and NOI, NOT and DMR instructions is very onerous on operators and the burden to the O&G Industry does not have any apparent additional protection to the environment.
42	Reporting Requirements – Signatory Requirements (Certification)	Part II.D.10.c	" I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I have no personal knowledge that the information submitted is other than true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."	<u>The Joint Trades are requesting</u> the deletion in the certification statement because it is not consistent with the certification statement found at 40CFR 122.22.d. The correct certification statement found in the regulations is: <i>"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."</i>
43	Reporting Requirements – Electronic Signatures	Part II.D.10.d	"Electronic Signatures: Please visit http://www.epa.gov/region6/6en/w/offshore/home.htm for instructions on obtaining electronic signature authorization to sign eNOIs, eNOTs, and NetDMRs."	<u>The Joint Trades request</u> that this website be activated prior to the effective date of the permit and that all applicable instructions be uploaded to it. The EPA website listed is not currently active. The lack of active website, email address and NOI, NOT and DMR instructions is very onerous on operators and the burden to the O&G Industry does not have any apparent additional protection to the environment.
44	Section G. Definitions	Part II.G	<i>Unused cement slurry- cement slurry used for testing of equipment or resulting from cement specification changes or equipment failure during the cementing job.</i>	<u>The Joint Trades request</u> adding this definition for "Unused Cement Slurry". The rationale for this addition is included in Comment No. 30 for Part I.B.10.a. Not accepting the proposed permit language is onerous on operators and an additional burden to the O&G Industry with no apparent additional protection to the environment.
45	Section G. Definitions	Part II.G.86	"Uncontaminated Freshwater" means freshwater which is discharged without the addition or direct contact of treatment chemicals, oil, or other wastes. Included are (1) discharges of excess freshwater that permit the continuous operation of fire control and utility lift pumps, (2) excess freshwater from pressure maintenance and secondary recovery projects, (3) water released during training and testing of personnel in fire protection, and (4) water used to pressure test or flush new piping or pipelines, and (5) potable water and off-specification potable water.	<u>To provide clarification, the Joint Trades request</u> adding the addition of "potable water and off-specification potable water" to the definition for "Uncontaminated Freshwater". Not accepting the proposed permit language is onerous on operators and an additional burden to the O&G Industry with no apparent additional protection to the environment.
46	Appendix F – Table 1	Appendix F – Table 1	Appendix F – Table 1	<u>The Joint Trades request</u> that once all edits and changes to the permit text language is complete, Table 1, Appendix F requirements should be updated accordingly to match. <u>The Joint Trades would prefer</u> that Table 1 be removed completely from the permit because EPA has historically stated that the permit text holds precedent over Table 1, and because of potential inconsistencies between the permit language and Table 1. Not accepting the proposed permit language is onerous on operators and an additional burden to the O&G Industry with no apparent additional protection to the environment.

APPENDICES

APPENDIX A

COMMENT NO. 9 & 39

CHEMICAL TREATMENTS AND USAGE
IN OFFSHORE OIL AND GAS PRODUCTION SYSTEMS

■

Prepared for
AMERICAN PETROLEUM INSTITUTE
Offshore Effluent Guidelines
Steering Committee

by
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SUMMARY

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ABSTRACT

This report reviews the chemicals used to help control many operating problems encountered in U.S. offshore oil and gas production. The discussions cover all chemicals used, including production treating chemicals, gas processing chemicals, and stimulation and workover chemicals. Each topic includes problem description, generic chemical types, **solubility** and treatment methods and concentrations.

A portion of these chemicals will dissolve in the produced water. Most of the water produced with oil and gas in offshore operations in the U.S. is treated to remove dispersed oil and grease, then discharged to the sea. The discussion on environmental aspects provides information on the aquatic toxicity, solubility, and treatment practices for chemicals used for each purpose. Actual environmental impact must include site specific factors, such as **water depth, current, temperature, etc., which are outside the scope of this report.**

Acute aquatic **toxicity** and solubility information was provided by the chemical suppliers for the production treating chemicals, including biocides, **scale and corrosion inhibitors, emulsion breakers**, etc. Aquatic toxicity data for the gas processing chemicals (methanol, glycols) was primarily obtained from the literature. No aquatic toxicity data was obtained for the stimulation and workover chemicals from the suppliers. Typical treatment methods and system configurations were obtained from operators and chemical suppliers. No assessment of the **quality** of this data is included.

INTRODUCTION

OBJECTIVE

The objective of this report is to examine the **purpose, chemical nature, properties, and treatment** methods for the broad range of chemicals used in offshore oil and gas production in the U.S. An important part of this examination will be a summarization of the available data on acute aquatic toxicity of those chemical constituents which are likely to end up in produced water being discharged to the ocean. Evaluation of environmental impact involves factors other than the nature and concentration of chemicals added in production operations and is beyond the scope of the study. The report is not primarily a literature search, but data references and illustrative articles and books are listed.

Considerable attention continues to be focused on the effects of offshore oil and gas producing **operations on the marine environment**. One aspect being examined is the discharge of produced water into the ocean. Removal of produced oil from water has long been recognized as an essential step with

strict standards having been established by the Environmental Protection Agency^{1,2}. The 1976 requirements for best practical technology (BPT) had been scheduled to expire on June 30, 1984 but were extended. Proposed revisions for best professional judgment/best available technology published for review in 1985² did not alter the regulations on produced water discharge. Revised New Source Performance Standards (NSPS) were included in the revised National Pollutant Discharge Elimination System (NPDES) permits for the Gulf of Mexico³ issued in 1986. The regulations concerning oil content of the produced water were modified. Present EPA permits do not limit treating chemicals in the produced water discharges. Governmental and intergovernmental agencies in other areas of the world (e.g. North Sea, Baltic Sea, Mediterranean Sea, etc.) are considering preapproval of treating chemicals in produced water discharges.

Constituents of produced water have previously been evaluated. Studies by Middleditch⁴, Zimmerman and DeNagy⁵, the API⁶, the Offshore Operators Committee (**OOO**)⁷, and others⁸ have considered various aspects of the treating chemicals in produced water streams. This study is an update of the 1985 OOC report, but expanded to include the broad range of chemicals used in offshore oil and gas production operations in the U.S.

Table 1 provides a concise overview of the offshore oil and gas industry in the U.S. All of these numbers were considered preliminary by the **sources, subject to revision**. The water production data probably has the greatest **uncertainty**. However, even these data are sufficiently accurate to give a good perspective of the industry. It is apparent that the Gulf of Mexico is the major offshore producing area by any of the statistics. Corresponding emphasis has been placed on that area in this survey.

1988 Offshore Oil and Gas Statistics				
	Gulf of Mexico	Calif.	Alaska	Total
Wells⁹				
Oil	5,892	2,000	333a	8,297
Gas	4,762	18	22a	4,762
Operating	10,614	2,090	355a	13,059
Shut in	2,344	537	36a	2,917
Production: Barrels/day or MMSCFD @ 15,000 psia				
Oil ¹⁰	819,000	86,000	43,000	948,000
Water ¹¹	1,502,230b	877,534	93,963	2,473,727
Gas ¹¹	13,456	143	160	13,769
a. Offshore not broken out, assumed 25%. b. State water production not available, assumed 10X of federal water production.				
Table 1. Summary of Statistics on Offshore Oil and Gas Production Industry in U.S.				

SCOPE

Chemicals that may be used in routine offshore producing operations in the United States are included in the scope of **this** report. For purposes of discussion, these chemicals have been arbitrarily placed into three groups. The production treating chemicals are those routinely added to the produced fluids or to seawater or other source water that is injected for waterflooding. These chemicals are added for various purposes (such as corrosion or scale inhibition). The gas processing chemicals discussed are those used for freeze point depression of gas hydrates or for dehydration of produced gas. Hydrogen sulfide and carbon dioxide are not normally removed from gas offshore and these sweetening chemicals and processes are not covered in this report. The third group consists of the stimulation and workover chemicals, including the acids and dense brines, along with their associated additives. Each of these groups will be defined more fully in the following section and examined in greater detail **in later sections**.

APPROACH

The objectives of this paper can only be met by utilizing a variety of sources of information. The nature of the problems and control methods have been discussed in the technical literature from time to time but are constantly undergoing change as products and treatment methods are improved. Most of the production treating chemicals are highly complex **mixtures** rather than pure compounds and are usually **considered** proprietary, with the best descriptions often being found in the patent literature. Actual treatment methods and concentrations vary substantially between operators, fields, and even wells within a field. Results of aquatic toxicity tests on the proprietary formulations are not routinely published or reported. On the other hand the gas treating chemicals are relatively pure chemical compounds. Aquatic toxicity of these chemicals are available in the literature for a few species. The acids are also relatively pure, but there **is** considerable uncertainty in the concentration of unreacted acid remaining in the discharged fluids.

It was decided that the best overall results could be obtained using a three faceted approach: interviewing chemical suppliers and operating companies plus a literature search.

Interview Chemical Suppliers. Discussions were held with technical specialists with three major suppliers of production treating chemicals. Composition of products, recommended application procedures, water vs oil solubilities, and the aquatic toxicity of products in the marine environment were

discussed. Further discussions were held with other suppliers with respect to aquatic toxicity information. Their contributions and review of the paper have supported the general points or brought out additional information. Information on acids and workover fluids and additives was obtained from several suppliers. Aquatic toxicity data on the gas treating chemicals were obtained primarily from the literature, plus one supplier.

Interview Operating Companies. Discussions were held with representatives of four major operating companies. Technical specialists concerned with environmental factors and engineers responsible for operations and treatment of oil and gas production offshore were interviewed. Application, treatment, and monitoring procedures for the treating chemicals were discussed as well as methods of disposing of produced water. [In the 1985 survey these four companies operated 2223 (34%) of the 6525 wells in the OCS and state waters in the Gulf of Mexico (1983)12 and produced approximately 42% of the liquid hydrocarbons (1984)13. [In 1988 these companies operated 3844 (36%) of the 10,614 wells and produced 36% of the liquid hydrocarbons and 49% of the produced water in the Gulf of Mexico. Two of the companies also have operations offshore California and Alaska. While **this** experience directly reflects actual operating practices for about one third of the US offshore operations, review of this paper by representatives from other operating companies has confirmed the general conclusions or brought out other practices.

Literature Review. Computer searching of several data bases indicated that general searching for offshore pollution and toxicology was impractical due to the large number of references pertinent to oil spills and cleanup. The cited references resulted from more specific searches and/or were provided by the technical specialists in the various fields. Relatively little information on aquatic toxicity of production treating chemicals was found in the literature. Useful information was found for the gas treating chemicals.

At the outset of the 1985 study, it was apparent that it would neither be feasible nor necessary to try to list the properties of every production treating chemical sold for offshore use. That conclusion is still valid, including the gas processing, stimulation, and workover fluids. Many of the products within the various suppliers' lines for a specific purpose are similar (though not necessarily identical) and are built around the same basic chemical structures. [In **some instances these generic chemical types are** specific chemical compounds, e.g., methanol. The general consensus was that the study should focus on the relatively few generic chemical types of materials

that are used for the various purposes in offshore operations. Consequently, most of the discussions will be directed at generic chemical types on an individual basis. However, the aquatic toxicological studies were performed on specific product formulations. These data are considered to be indicative of the properties of a particular generic type, but it should be recognized that the additives in a formulation can have significant effects of their own.

DEFINITIONS, USAGE OF TERMS

PRODUCTION TREATING CHEMICALS

Treatment Purpose. Any treating chemical used in producing operations will be added for a specific purpose, to reduce or mitigate some type of operating problem. Unless that problem becomes significant, the chemical will not be added for obvious economic as well as technical reasons. None of the **operating companies interviewed encountered such** a broad range of problems that all types of treating chemicals listed below were necessary. However, it was often necessary to add more than one treating chemical in a system. Alternate technology can be and often is used to control the various problems, **either alone or in conjunction with chemical treatments.**

Chemical treatments are often the only effective and/or economical method for some types of problems. The following listing of problem areas and treating chemicals are generally accepted nomenclature. **However, there are some variations between companies and individuals.** For example, 'water clarifiers' was used for the reverse breakers, etc. Each of these problem areas will be discussed separately later.

<u>Problem</u>	<u>Treating Chemical</u>
Mineral scale deposits	Scale inhibitor
Equipment corrosion	Corrosion inhibitor
	Oxygen scavengers
Bacterial fouling	Biocide
Water-in-oil emulsion	Emulsion breaker
Oil-in-water emulsion	Reverse breaker
	Coagulants, flocculants
Solids removal	Coagulants, flocculants
Foaming, oil or water	Antifoam
Paraffin deposits	Paraffin inhibitor, or solvent

Generic Chemical Types. Virtually all oilfield treating chemicals are complex mixtures manufactured from impure raw materials. There can be dozens of different molecular compounds of similar chemical and/or biological activity in a batch of reaction

product. These individual compounds will differ slightly in the number of carbon atoms or perhaps in branching in a long **chain**, factors which usually have little effect on the chemical activity. Minor amounts of unreacted raw materials and reaction byproducts may also be present. Yet within this complexity, there is a central chemical functional group that imparts the primary properties of the specific mixture. It is this central chemical functional group that will be used to define the *generic chemical type*. These *generic chemical types* are sub-classes within the chemical families used in the oilfield. Undoubtedly many other chemicals can contain this same chemical functional group, yet have totally different properties resulting from other parts of those molecules. Those chemicals are not used in the oilfield and are excluded from this definition.

The specific mixture obtained from the reproducible but impure raw materials under carefully controlled reaction conditions is often called a *compound* for convenience. [Italic *compound* will be used to differentiate this usage from the normal chemical definition.] For example, the simplest form of a corrosion inhibitor *compound* may be suitable in one type of production system (e.g., high gravity paraffin crude with low water content) but may be much less efficient at higher water content even in the same field. Thus, the *compound* will often be modified to change the phase distribution behavior somewhat to allow the *compound* to be 'effective over a broader range of water/oil ratios. A common way to adjust this distribution is the reaction of the *compound* with ethylene or propylene oxide. Ethylene oxide increases water solubility of a *compound* with low water solubility. Propylene oxide increases the hydrocarbon solubility of a *compound* with low oil solubility. The oxides may be reacted into the *compound* during its initial formation or by reaction with an intermediate *compound*.

Solubility is an extremely important factor in oilfield treating chemicals. In some cases the chemical can only work to fulfill its purpose at the interface between two of the phases, i.e., the *compound* must be surface active. This surface activity can often be enhanced by limiting the solubility of the *compound* in the oil and in the water phases to the minimum that is still adequate to carry the *compound* through the bulk fluids to the interface. Various ratios of ethylene and propylene oxide are commonly used to accomplish this goal, resulting in the desired oleophilic/hydrophilic balance. These **balancing factors are critical in emulsion breakers**, for example; even though virtually all of the emulsion breakers end up in the oil phase. The balance is not important for chemicals with other purposes, such as biocides and scale inhibitors, which have high solubilities in water and stay in the water phase.

Formulations, Additives. The **products** sold by the chemical supply companies, which we will call formulations, usually contain materials other than the one *compound*. Any materials in the formulation other than the *compounds* for the primary purpose will be considered additives in this paper. As a minimum there will be a solvent, as most of the *compounds* would be extremely viscous, solid, or even unstable at concentrations approaching 100%. The other materials may be different *compounds* for the same specific purpose, small amounts of *compounds* for another purpose, other solvents, or other chemicals added for specific reasons to allow better achievement of the primary purpose. For example, a surfactant may have a substantial beneficial effect on the efficiency of a corrosion inhibitor *compound* but will be considered an additive. It should be noted that most chemical suppliers consider the active content of a formulation to include everything except totally inert solvent(s). Important exceptions are the **paraffin** solvents, which are essentially 100% solvent *compound* plus a small amount of surfactant.

The objective of the more detailed listing of the components in this paper is to allow estimation of the ranges of concentration of various *compounds* and additives in the treated fluids and in the water discharged to the ocean. In many instances, the formulation will include more than one *compound* from the same generic chemical type or *compounds* from two or more generic chemical types for the same purpose. This approach is often necessary to obtain optimum effectiveness, such as better emulsion breaker **efficiency**. For example, from a dozen intermediate *compounds* of three generic chemical **types**, a chemical supplier could **prepare a hundred** different formulations by blending different ratios of different *compounds*. Perhaps a tenth of these formulations have relatively broad application to many oilfields with the remainder being more or less formulated for one, **two**, or a few specific oilfields.

Additives are placed in the formulation for specific purposes. Solvents, usually the major additive, are required to provide fluidity for the normally **viscous compounds**. Water is the obvious choice for water soluble *compounds*, with refinery cuts of hydrocarbons (heavy aromatic naphtha, etc.) used for oil soluble *compounds*. **Methanol**, isopropyl alcohol, and ethylene glycol are other common additives used **to provide cosolvent freeze protection, lower viscosity and/or pour point, etc.** They may be essential to maintain a uniform, stable, and usable formulation in the drum. Typically other additives function after the formulation is in the system. For example, addition of a surfactant to a biocide or corrosion inhibitor allows better penetration through deposits. A small amount of emulsion breaker or antifoam **may be added to a corrosion inhibitor to minimize** adverse effects on the oil or gas separation process.

Multipurpose Formulations. Often there are **two** or three problems in a producing system which require chemical **treatment**. The operator may add three formulations independently, allowing each chemical to be optimized separately. Alternately, a single formulation containing all three chemicals for the three purposes may be added with a single pump. Both technical and economic factors must be considered in choosing the best approach. In either approach, it is important that the *compounds* for the various purposes do not interfere with each other, by **direct** reaction or otherwise. The need for compatibility is even more **stringent** in multipurpose formulations because the components must all be mutually soluble and non-reactive in the drum.

An example of a multipurpose formulation for **treating** water for injection could include an oxygen scavenger and a quaternary amine for corrosion control and a phosphonate for scale control. The percent of each *compound* is likely to be lower than in the comparable single purpose formulation but the overall treating concentration probably will be higher to achieve about the same concentration of active *compound* in the system.

The effect of the individual components of the multipurpose formulations on and in the environment will be similar to their effect in single purpose formulations. Hence, these types of formulations will not be discussed separately. It is important to **note again, however, that aquatic toxicity tests are** normally conducted on actual formulations as sold to the operating companies. The test results will reflect any interaction effects on the test species.

GAS PROCESSING CHEMICALS.

The high cost of space and operations on offshore platforms greatly restricts the amount of gas processing done offshore. Only processing or treatment is done that is required to get the **gas** to shore safely. It is sometimes necessary to add a chemical to reduce the freezing point of gas hydrates. In some instances operators choose to remove virtually all of the water from the gas on the platform before sending it through the pipeline to shore.

Hydrate Inhibition Chemicals. Natural gas hydrates are ice-like solids consisting of a mixture of water, hydrocarbon gas molecules, and particularly carbon dioxide and hydrogen sulfide gases if present. These solids can form in equipment under **certain** conditions, blocking or breaking lines similar to frozen water pipes. However, they differ from ice in that they can form above 32 F, even above 80 F, depending on the gas composition and pressure. **Solidification temperature increases with higher pressures.** higher molecular weight hydrocarbon

gases, and higher acid gas concentrations. Some liquid water must be present for hydrates to form. Condensed water vapor is usually sufficient, but produced formation brines can also result in hydrate formation. However, a high salt concentration in produced water lowers the hydrate freezing point, similar to the way salt lowers the freezing point of water.

Freezeups can be prevented by adding chemicals when required. These chemicals are called hydrate inhibitors or freeze point depressants. The two most common chemicals are methanol and ethylene glycol. However, in many instances the gas remains too warm for hydrates to form and no treatment is required. In other instances, hydrates may form seasonally during cold weather, requiring continuous treatment only during part of the year. Batch treatments may be required during shutdowns. In a few instances hydrates are a serious problem at all times. Continuous treatment may be required as part of a low temperature process to remove heavier hydrocarbons from gas. In this instance or for large systems, the hydrate inhibitor may be recovered and recycled. **For most cases it is not economical to recover the chemical.**

Dehydration Chemicals. A large fraction of the water vapor can be removed from natural gas by absorbing it into a solvent. Triethylene glycol is the most common chemical used in natural gas dehydration. The gas contacts the glycol in a tall absorption column at high pressure and ambient temperature. The dry gas is sent to the pipeline with a water dew point typically below 20 F. The wet glycol is heated and sent to a low pressure desorber. The water is flashed off and the glycol is cooled and pumped back to the absorption column. Some makeup glycol has to be added to compensate for volatility and spray losses, but there is no continuous discharge. Side-stream filtration and purification allow the glycol charge to be regenerated almost indefinitely. Occasionally it may be necessary to discard a batch of glycol because of severe contamination or degradation.

STIMULATION, WORKOVER CHEMICALS

Acids and Additives. During the life of a producing or injection well it may become necessary to stimulate flow by removing deposited accumulations from the wellbore, perforations, and formation. The accumulations may be due to scale deposits of calcium carbonate or various corrosion products such as iron sulfide, oxide or carbonates. These solids can partially block the flow paths through the formation rock. These materials are all soluble in hydrochloric acid, the most commonly used oilfield acid. Since

calcium carbonate is also a common component of reservoir rock, the acid may also increase the size of the original flow channels. Acidizing is also frequently used during the initial completion of the well if the formation composition and permeability are appropriate. **Fine** sand or clay particles may migrate through the formation until they lodge at some point, also blocking flow. A mixture of hydrochloric acid and hydrofluoric acid (mud acid) is used to dissolve these solids. Other acids are sometimes used.

There is always at least one additive used in an acid stimulation job, the corrosion inhibitor. All of these acids are severely corrosive to the steels used in wells, piping and production equipment. Other chemicals may also be dissolved in the acid or in fluids used in conjunction with the acid on the stimulation job. Surfactants are often used, especially if the oil gravity is low or paraffin deposits are likely. Paraffin solvents may be required in severe cases. **Clay stabilizers are sometimes required, as are iron sequestrants or scale inhibitors.** Chemicals to prevent emulsification of oil and acid or sludging of the oil may be necessary.

Workover Fluids and Additives. Brines are often used during workovers and completion operations. The density of the brine must be high enough for the hydrostatic head of the fluid column to contain the formation pressure. Clear brines are preferred to muds so that the solid particles will not cause permanent plugging of the formation around the wellbore. Seawater (8.4 lb/gal) is sometimes used for flushing or for low pressure formations. Densities to 10 lb/gal are available with sodium chloride brines, and to about 11.5 lb/gal with calcium chloride. These systems provide adequate density for most wells (perhaps 95% or more). Mixtures of calcium chloride and calcium bromide extend the range to about 15.4 lb/gal. Calcium bromide and zinc bromide mixtures up to 19 lb/gal are available for those last few wells with extremely high pressures.

A wide range of additives can be used, depending on the operation. Untreated seawater may be used to flush the bulk of the fluid from the tubing/casing annulus when the well is reopened. Corrosion inhibitors and bactericides may be added to brines that are to be left in the annulus as packer fluids. Thickening agents and dissolvable particles (e.g., salt, calcium carbonate) may be added to prevent excessive volumes of brine from draining into the formation during the workover. Thickeners may also be used to help suspend sand being pumped into the well during gravel packing. These sand grains are **too large to enter the formation but restrain** unconsolidated formation sand during production.

TYPICAL SYSTEMS

PRODUCTION PROCESS FLOW SCHEMES

The process flow scheme, equipment, and operating conditions can and do vary widely, depending on the properties of the hydrocarbon fluids and the size and producing rate of the reservoir. While no one system is truly typical, there are similarities. The highly simplified diagram in Figure 1 shows a scheme with many of the components that are typical of offshore oil production systems, although most systems **will** not contain all of the equipment shown. This figure is intended to provide a general guide to terminology used in the paper as well as illustrate some of the system factors which affect the chemical **treatments** and disposal of produced water.

Several producing wells are connected to production manifolds which carry the produced fluids to the appropriate separators. Those wells with the highest pressure are routed through the high pressure manifold to the high pressure separator (e.g., 1500 psig). Most of the gas is separated and the combined oil and water stream is sent to the intermediate pressure separator. Wells with intermediate pressure flow through the intermediate manifold directly to the intermediate separator (e.g., 500 psi). Much of the remaining dissolved gas is flashed as it enters this separator. The combined oil and water then flow to the low pressure separator (e.g., 50 psig), often called a free water knock out (FWKO). Most of the remaining gas is flashed and the free water is separated. The oil, still containing a few percent of water as a dispersed emulsion, flows to **the** bulk oil **treater** (e.g., **15-30 psig**) where the water content is reduced to sales/pipeline specification. A high pressure separator may not be required in all fields, with the manifolds then connecting to the intermediate and FWKO respectively. Later in the life of a field, the operating pressures of the high and/or intermediate pressure separators may be reduced to maintain the desired deliverability from the wells. Electrostatic grids may be incorporated in the bulk oil treater to improve the removal of water from the oil. Occasionally, the oil is sent to the pipeline directly from the bulk oil treater (with or without pumping) while in other instances an atmospheric pressure tank is used **to** release more gas (with pumping obviously being required).

The high pressure gas may flow directly through dehydration facilities into a pipeline to shore. Compression is required for the intermediate and low pressure gas **and** must often be added for the high pressure gas as the field gets older and the pressure decreases. Some of the gas is usually used as fuel on the platform and/or to gas lift low pressure oil wells. Glycol dehydration is the most **common method for removing water from the gas.**

The gas flows upwards through a tower, contacting a falling stream of dry glycol on trays. The water in the gas is absorbed **into** the glycol, usually triethylene glycol (TEG). The wet TEG is heated and sent **to** a second low pressure tower. The water is flashed off and the TEG is cooled and pumped back to the contactor tower. The TEG is not consumed, but is continuously recycled in a closed loop.

Produced water is collected from the free water knock out (sometimes from the high pressure separator and any atmospheric pressure tanks) and sent to the produced water treating system. The first vessel in the system is often a surge/skim tank to collect free oil and smooth out flow **variations**. This tank may allow discharge specifications to be met in some instances, especially with very light oils or condensate. Further processing equipment varies, e.g., a corrugated plate interceptor (CPI) unit and/or a multistage flotation cell are sometimes used. This equipment will reduce suspended solids and oil concentration to low levels to meet requirements but have essentially no effect on water soluble materials. Offshore, produced water is discharged to the sea after this treatment.

Most production systems will include a test separator(s). Since measurement of two or three phase flow is extremely difficult, manifolding and valving is included so that production from any one well can be isolated to the test separator(s) and each phase measured separately. The fluids are then recombined.

Even this simplified scheme can have several variations, depending on the nature of the field. All of the wells may be on the same platform (or bridge-connected) with **the** processing equipment. In some cases, however, the design concept calls for production from several multi-well platforms to be sent to a central processing complex, with only a test separator on the wellhead platforms. This situation has also developed late in the life of some fields when production rates become too low to justify operating costs for the separation equipment for an outlying platform. The equipment was bypassed and the fluids were sent to the central facilities. In other instances, the design **calls** for the water to be sent to shore along with the oil, with final oil-water separation performed at the shore facility. This approach eliminates the platform space and weight requirements for the water treating and oil treating equipment but requires additional pipeline capacity. Finally, some recent systems for very deep water have used a captive tanker to provide processing space **and interim storage, with oil shipment to market via shuttle tanker.** This **latter** approach is not yet common and has no additional impact on produced water disposal. The first three do have a significant impact on the disposal of treated produced water and will be discussed in more detail.

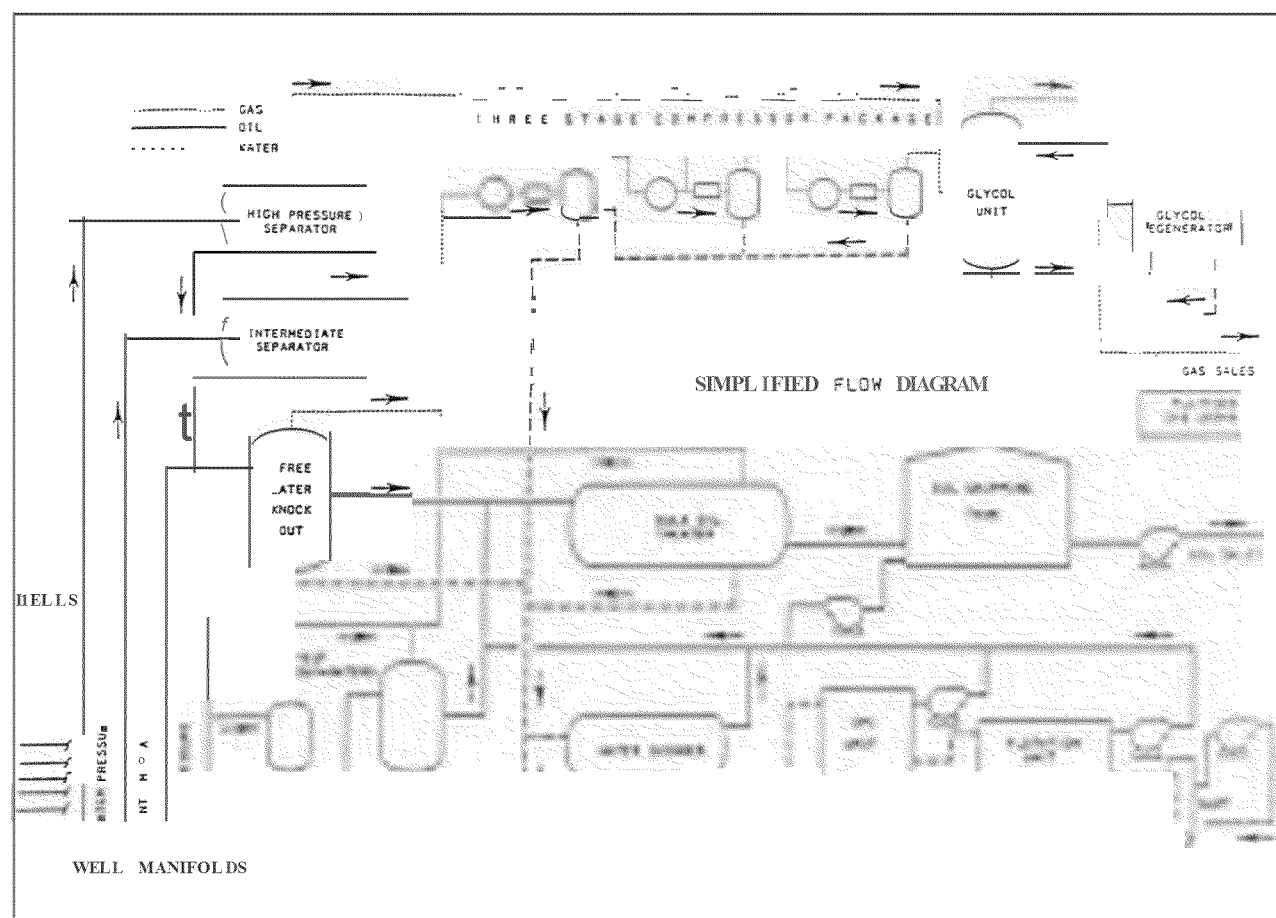


Figure 1. **Simplified** typical process diagram for an offshore platform in an oilfield.

Processing of gas wells (from gas fields or gas wells in an oil field) is similar yet different. Most of the gas wells operated by the companies surveyed produce relatively **little** liquid. The entrained **liquids** are removed in separators. If all wells do not produce at pressures above pipeline pressure, an **intermediate separator and gas compressors are required**. The gas may be dehydrated in a glycol unit and sold to a gas transmission pipeline company at the platform. The liquids (light oil, **hydrocarbon** condensate, and small amounts of water) are sometimes processed and sent to shore separately from either the gas or oil from the area, depending on technical and contractual factors. In other instances the gas, oil and produced water are sent to shore in the same pipeline for all processing. In the 1985 survey one operator noted that only one of their twenty-three gas platforms had a water discharge. The other platforms had no water production or the water went to shore with the hydrocarbon condensate to three receiving plants, which injected a total of about 5500 BPO water into disposal wells. On the other hand, another operator had produced water

discharges on all twenty-six of its gas platforms. These situations have not changed substantially in **the intervening four years**.

SINGLE COMPLETE PLATFORM

If the field is geographically compact, it may be feasible to drill all of the wells from one platform. Locating the processing equipment on **the same** or a bridge-connected platform allows all operations to be done with minimal boat support, etc. Usually there will be ten or more producing wells on a **platform**. Platforms in deeper water are generally more expensive and have more producing wells, with more than fifty being provided for in some instances. Any batch treatment or slug treatment of the production from any one well will be diluted with the production from the remaining wells, reducing the effective **concentration of the treating chemical in the produced fluids** flowing to the separators and, hence, in the discharged water. All or even most of the wells could not be treated simultaneously because of **excessive pump and/or manpower requirements and**

the adverse effects on overall production rates. Even if these restraints were not present, all wells would not be treated simultaneously because of the increased risk of high concentrations of treating chemicals causing an upset of the separation equipment.

In some circumstances, outlying single wells are brought directly to the processing platform. This approach was more common earlier in shallow water with shallow reservoirs. Directional drilling could not reach the edge of the reservoir and free standing wellheads were feasible. Subsea completions are now feasible for deeper water. In either case, the concentration of treating chemical from any kind of batch or **squeeze-type** treatment will still be diluted in the processing equipment by the production from the remaining wells. A separate line may be required to send hydrate inhibitor to remote wells continuously or intermittently to prevent hydrate plugging.

CENTRALIZED PROCESSING PLATFORM

Large fields may require several drilling/production platforms to provide adequate access to all areas of the reservoir. Processing equipment on these platforms can range from a high pressure test separator through a complete processing system. In most such fields, however, it has been common for most of the processing to take place on the production platform, essentially the same as the previously described system. As some platforms in a field approach their economic **limit**, equipment on outlying platforms is being bypassed and production sent to a central platform for processing and for shipping of the oil and gas to shore. The produced water is also treated and discharged at this central facility.

In this configuration, a high concentration of treating chemical from any one well will not only be diluted with the production from other wells on that platform but also by the production from other platforms. High concentrations of corrosion inhibitor or biocide used in treating gathering lines from an outlying platform will be diluted by production from other platforms. Multiple platforms make it even less likely that a high percentage of the wells sending water to a common discharge could undergo batch or squeeze treatments simultaneously.

ONSHORE PROCESSING

There are several systems where all or **part** of the processing is performed after the produced fluids are brought to shore. The most common scheme is to separate the gas offshore and send it to shore through a different pipeline. Oil and produced water are not separated offshore but flow to shore in a **common pipeline**. **Chemical concentrations in the**

liquids resulting from well treatments would be diluted by the total production. One such system has over 150 producing wells, which would dilute chemicals used in any one well by about two orders of magnitude. For example, a concentration of 1500 ppm corrosion inhibitor at the wellhead after a squeeze treatment might be reduced to 10-15 ppm by the time it is discharged from the central facilities. Even batch treatment of equipment on any platform would be diluted by at least one order of magnitude.

Sending the oil and water to shore increases the risk of problems in the pipelines. Pigs are sent through the lines to prevent accumulation of solids, paraffin, or corrosion product in the lines, all of which could contribute to pitting-type corrosion as well as reduce throughput capacity. **Chemical treatment is used to minimize corrosion. In one** system, a dose of biocide is used behind the pig to kill sulfate reducing bacteria, with a subsequent slug of corrosion inhibitor supplementing a low continuous treatment. The batch treatment of chemicals are diluted by a factor of five to ten as it moves through the water treating equipment on shore.

GAS PROCESSING

It is sometimes necessary to add a hydrate inhibitor to prevent solid natural gas hydrates from forming in high pressure gas lines. The ice-like solids can form at temperatures well above 32F. The inhibitor, normally methanol, is usually added continuously at the wellhead to prevent the hydrate from forming in the system until the water can be removed from the **gas** stream. Addition may be required only in the **winter when temperatures of air and seawater are lower.**

Dehydration is normally the only gas processing performed offshore. Primarily this choice is necessitated by the high cost of platform space and much higher operating costs than onshore facilities. Dehydration is desirable to reduce the risk of corrosion and hydrate formation in the pipelines to shore. **However, in some instances untreated gas is sent to shore, with corrosion and hydrate inhibitors added to prevent problems. However, there is at least one offshore location where gas is sweetened (H₂S and CO₂ removed).**

Glycol dehydration using triethylene glycol (TEG) is the only process used to remove water from gas in offshore operations (Figure 2). In some systems the hot produced gas will be cooled prior to entering the glycol unit. Some of the water will be condensed and then separated in the inlet knockout vessel, reducing the size of the glycol facilities. The knockout vessel greatly reduces the risk of any produced liquids being carried into the contactor, where it could contaminate the TEG. The gas

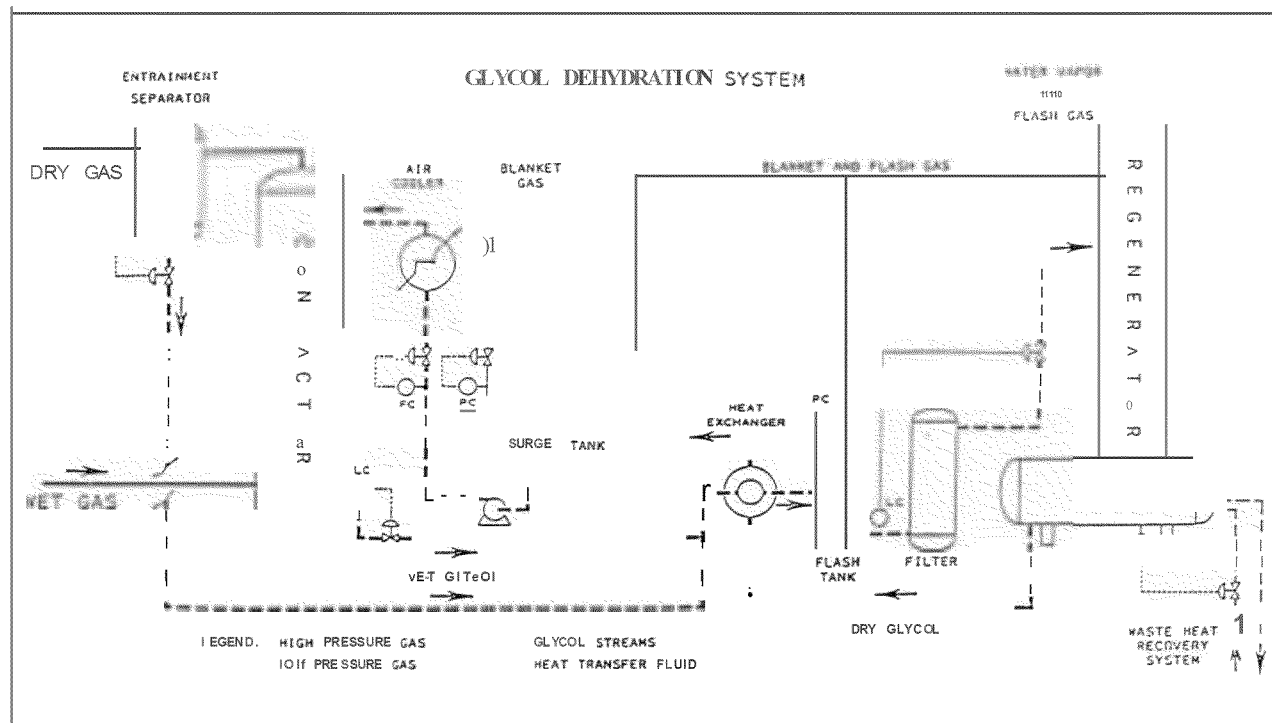


Figure 2. Simplified Process Diagram for a glycol dehydration unit using waste heat recovery.

enters the bottom of the tall contactor tower. As it flows upwards through a series of trays the gas is intimately mixed with a falling stream of TEG. Some water is absorbed into the TEG on each tray and the gas becomes progressively drier. The gas exiting the top of the contactor has been dried sufficiently so that liquid water will not condense as the gas flows to shore.

The TEG leaving the bottom of the contactor is rich in water and saturated with natural gas. The TEG flows through a heat exchanger, flash tank, and filter before it enters the regenerator tower. The water is boiled from the TEG in the regenerator, reducing the water content to 0.2% or less. Heat is normally supplied from waste heat recovery units on offshore platforms to eliminate the safety risk of direct fired heaters. The hot, dry TEG flows back through the heat exchanger to a surge tank. A recycle pump sends the TEG through a cooler back to the top of the contactor.

In addition to providing consistently dry gas economically, a key factor in the acceptance of this process is the low consumption rate for the TEG. Very little TEG is lost with the dry gas flowing to the pipeline. An entrainment separator minimizes spray carryover and the TEG is used because of its low vapor pressure. Similarly, very little TEG is lost in the regenerator overhead.

WATERFLOODING

Waterfloods are not as common in offshore operations as in US onshore operations but neither are they unusual. The water comes from source wells in many instances, but seawater is also used. Source wells completed in non-hydrocarbon aquifers are desirable because very little surface equipment and treatment is required. However the aquifer must be sufficiently large to provide all of the required water and should be highly permeable to minimize the number of source wells. Whenever possible, a source water will be selected that is chemically compatible with the formation water in the oil zone(s), minimizing scaling problems in the producing wells. Since high concentrations of barium, strontium and calcium are frequently present in produced water from the Gulf of Mexico and offshore California, source waters with low sulfate ion concentrations are preferable. The advantages of source wells must be balanced against their cost, uncertainty in their delivery capacity, and ongoing lifting costs.

Seawater is an obvious water source for waterflooding, with unlimited capacity. More processing equipment and chemicals are needed but well costs are eliminated and injection costs may be lower. Corrosion control and prevention of injection well

plugging are the primary process objectives. Rigorous oxygen removal (mechanical deaeration by gas stripping followed by chemical oxygen scavenging) provides corrosion protection for most of the system. Corrosion resistant materials are used in that portion of the system handling aerated seawater. Removal of suspended solids by filtration is usually required, but cartridge **filters** are often adequate in river outfalls or deep water remote from shore where suspended solids concentration may be less than 1 mg/L. Scale inhibition is usually not required. Biological control to prevent corrosion and fouling of the equipment and injection wells is accomplished by a combination of chlorination, deaeration, and biocide treatment. Essentially all of the processed seawater is injected into the oil reservoir. However, seawater is not widely used in the Gulf of Mexico and offshore California because of probable severe scaling in producing wells. The **high concentration of sulfate in seawater entering the wellbore via more permeable reservoir streaks will react with barium, strontium or calcium entering from less permeable streaks.**

In the Gulf of Mexico waterflooding is not normally required. Even when it is needed, produced water is not normally used for waterflooding offshore for three main reasons:

- 1 In the early life of the field when water injection **can usually achieve maximum recovery, there is** often little or no produced water to reinject; hence, an alternate source must be developed.
- 2 Later in the life when quantities of produced **water become more substantial, it is very expensive** to retrofit or add additional processing equipment. Mixing of produced water with any original supply water greatly increases the risk that scale will be formed and plug the injection wells.
- 3 Any dispersed oil interferes with solids removal processes, making it very difficult and expensive to reach low concentrations of either material. Concentrations of 5 ppm or less solids and oil are often necessary to avoid wellbore plugging.

STIMULATION AND WORKOVERS

Stimulation and workover operations entail several kinds of activities designed to maintain or increase production from an existing producing zone in an existing well. Recompletions to a new zone normally involve drilling operations and are beyond the scope of this report. This discussion will be directed to those operations and practices related to fluids and byproducts that might end up in the water streams. For clarification of the scope of this report, it will be helpful to describe a "typical" scenario for completing an offshore well. The discussion is

necessarily general, with specific practices varying with the individual wells and areas. For example, the general practices described by Wedell¹⁴ are representative of practices for most wells in the Cook Inlet of Alaska. Higher density fluids must be used in geopressured gas wells in the Gulf of Mexico. Otherwise, many of his comments are equally applicable to the Gulf of Mexico.

Figure 3 is a simplified diagram of a typical offshore producing well. After the well is drilled to total depth, the production casing string is cemented in place. Excess cement is drilled out and the inside of the casing cleaned with casing scrapers, etc. Completion begins with the drilling mud and solid debris with seawater and/or dense brine, which is called the completion fluid. The completion fluid is often circulated and filtered for many passes until the fluid is free of solids. It is very desirable that the completion fluid be very clean, as solid particles could plug the formation around the wellbore. The hydrostatic head of this completion fluid must be high enough to contain the formation pressure when perforating guns blow holes in the casing into the producing zone (A). This requirement often necessitates using a dense brine.

If the producing formation is unconsolidated, as is common in the Gulf of Mexico and sometimes off California, it is necessary to control sand production. A gravel pack is a very common practice for this purpose. A slurry of coarse grained sand or manufactured ceramic or synthetic plastic granules is pumped down the well and into the perforations. The packer at the bottom of the tubing string is then set, isolating the tubing-casing annulus from the producing zone (B). **Several zones** may be perforated and gravel packed during the completion operations to facilitate changing to another zone after the initial zone is depleted. With suitable downhole hardware, it is possible to displace the completion fluid from the annulus with another fluid. The fluid remaining in the annulus during production is called the packer fluid and may or may not be the same as the completion fluid.

After the well is completed it may be desirable to stimulate the well so that the production rate will be higher. Stimulation is normally accomplished offshore by pumping acid into the well. The acid dissolves solids and opens or increases the size of flow paths. Hydraulic fracturing, another type of stimulation, **is extremely rare in offshore operations.** The unconsolidated sands in the Gulf of Mexico are not amenable to this type of stimulation. The enormous logistic problems of assembling the pumping equipment and supplies usually preclude it in other offshore areas as well.

The brines used as completion or packer fluids are seawater, sodium chloride, calcium chloride, calcium bromide, zinc bromide, and mixtures of

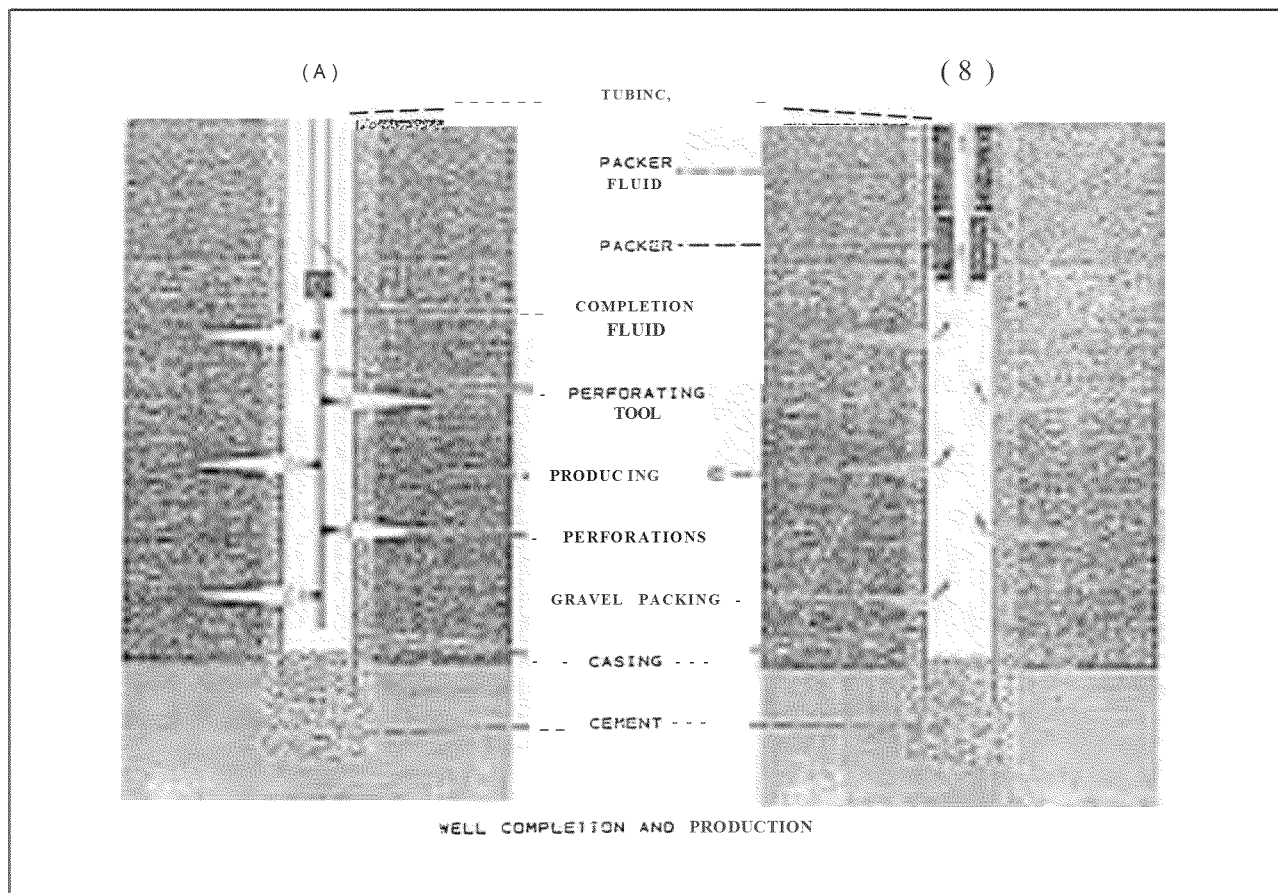


Figure 3. Simplified well diagram illustrating components in well completion operations.

these salts. In certain circumstances, potassium chloride or ammonium chloride may also be added to the above. Zinc bromide is almost always used in conjunction with calcium bromide and is rarely left in the annulus as a packer fluid. It is more corrosive and expensive and is usually circulated out and returned to shore for later use in other high pressure wells.

After the well is producing, further stimulation operations may be as simple as jetting accumulated sand from a producing well, but more commonly involve pumping acid into the producing zone to dissolve accumulated solids. Workover operations may require pulling the tubing string to replace defective downhole components or performing a new full gravel pack to control sand production. In many cases, however, several operations will be done, especially if it is necessary to bring a pulling unit to the platform. The costs of the unit are so high that any anticipated preventive work will be performed while the pulling unit is on location.

The acids used for stimulation are primarily hydrochloric and hydrofluoric acids. The hydrochloric acid dissolves most corrosion products and

calcium carbonate, while the hydrofluoric acid can dissolve fine particles of clay and sand. A pre-flush and post-flush of ammonium chloride is often used to prevent precipitation of calcium fluoride. An acid stimulation is often an integral part of a sand control job, to insure maximum production rate. The larger sand grains in the gravel pack are usually pumped down dispersed in thickened brine.

For many workovers it will be necessary for the fluid in the wellbore to be dense enough to contain formation pressure, i.e., kill the well. The same brines listed above are used for this purpose. However, it is important to note that as the formation pressure decreases during the life of the zone, the required density will decrease. It is possible to pump down a "pill" of thickened saturated sodium chloride brine containing a dispersion of solid sodium chloride particles. The solid salt will prevent the dense brine from seeping out into the formation during the workover, but will readily dissolve in formation water when the well is returned to production. Fine particles of calcium carbonate are also used, but require an acid wash to unblock the flow channels.

Mechanical workovers include such **things** as pulling the **tubing** to replace a leaking joint, down-hole components such as gas lift mandrels, or a leaking packer. In some instances gas lift valves, subsurface safety valves, and other small items may be retrieved **through the** wellhead with a wireline unit, avoiding the necessity of killing the well and pulling **the** tubing.

PRODUCTION TREATMENT CHEMICALS

Chemicals can be **and** are used for a **wide** variety of purposes in oil and gas production. It cannot be **overemphasized, however, that these uses are** normally in response to actual problems. The direct cost of the chemical is only a part of the cost of using **them**. Purchase of injection equipment, transportation, contracting for application services, proportional cost of employee time for application and monitoring, and value of deferred or lost production for some types of treatments are all major parts of the real cost of chemical treatments. The cost of the space for pumps and chemical storage may be the largest single factor on some offshore platforms. Treatments are not normally initiated unless the costs or risks for the problem are significant or expected to become significant. Because conditions are continually changing during the life of a field, any treatments should **be** frequently reviewed to determine if **they** are necessary and cost effective. Treatments will be modified or even discontinued to keep overall costs and problems at a minimum.

All **types** of chemicals used in treating **offshore** production are discussed in the following sections. None of the operators interviewed used all these chemicals in their operations, much less all on one platform or system. On the contrary, addition of only one or two chemicals on any one platform or in a system is **far more** common, **with many instances** where no treatment is performed on a platform.

SCALE INHIBITORS

Problem Description. Deposition of inorganic compounds from the produced water associated with hydrocarbon production can have a severe impact on operations. These deposits can actually seal off a producing formation and stop all production. Deposition can occur within **the** pores in the formation itself, in the perforations, or in the tubing. Deposits in surface flow lines can reduce the throughput capacity or require higher inlet operating pressures to maintain the same throughput. **Deposits on heater tubes reduce heat transfer, requiring** higher fuel consumption and increasing the risk of corrosion failure of the tube element itself and a

resulting fire. Deposits in valves can prevent **movement or complete closure which can interfere** with proper control or cause major equipment failure. Such valve failures would pose a serious risk to personnel or cause oil spills. Clearly it is necessary to control scale deposition for safe and proper offshore operations.

Fortunately, there are only a few common types of scale deposits in oilfield operations. The type of scale (if any) found in a particular field will depend on the composition of the water(s) and the system characteristics. Calcium carbonate is probably the most common scale. It is less soluble as the pressure decreases, even above the bubble point. If the pressure drops below the bubble point, some CO₂ flashes off, increasing the pH and causing more deposition. Mixing of incompatible waters (one high in calcium, the other high in carbonate) causes deposition. In addition, increasing the temperature causes calcium carbonate to deposit. Fortunately, calcium carbonate is very soluble at low pH and can be dissolved by acidizing.

Calcium sulfate (gypsum) will deposit when the **pressure decreases or incompatible waters are** mixed. It has a maximum solubility around 105°F, **with** deposition possible at higher or lower temperatures. Strontium sulfate is most commonly formed when incompatible waters are mixed. The solubility decreases at higher temperatures and lower pressures. Barium sulfate also commonly occurs if incompatible waters are mixed. It has a lower solubility at lower temperatures and pressures. **Deposition can occur as temperature and pressure decrease** when **the** water flows up **the** tubing.

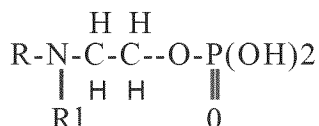
The actual solubility of any of **these scale** compounds is a complex function of temperature, salinity, pressure and composition. Fortunately, reasonably good solubility calculation methods are available: calcium carbonate^{15,16}, calcium sulfate (gypsum)¹⁷, barium sulfate¹⁸, and strontium sulfate¹⁹. These **methods** suggest whether scale deposition is possible and the most likely places where deposits will form. These calculation methods are based on experimental data showing the effect of **temperature, pressure, and concentration of dissolved salts and gases in the water**. Coupled with experience, the calculation methods allow many scale problems to be anticipated. The iron compounds (iron carbonate, iron sulfide, and iron oxide) are usually related to corrosion problems and are **controlled with corrosion inhibitors or other corrosion control methods**.

In most instances, nothing can be done to modify the conditions causing scale deposition. The scale compounds of interest are all less soluble at lower pressures. A water saturated with calcium sulfate or **calcium carbonate in the reservoir can start to** deposit scale in the formation as the pressure de-

creases²⁰. A water saturated with barium sulfate will start to deposit scale as it cools off¹⁸. However, there are occasions when system design and operating procedures can reduce or even eliminate scale problems. As an example, scale problems associated with incompatible waters (e.g., one containing high barium and a second with high sulfate concentrations) can sometimes be avoided by using subsurface supply wells instead of seawater. Fortunately, most produced waters on anyone platform in the Gulf of Mexico are compatible. Electrostatic separators can be used to aid in separation of water from oil, eliminating the hot heater tube surface where scaling could occur. Nevertheless, chemical treatment can be required to control scaling problems.

Chemical Description. All of the chemicals used to control scale deposition in oil and gas production systems work by interfering with crystal growth. The two most commonly used *compounds* are based on organic phosphorus chemistry, with a polymer type comprising the remainder. Inorganic phosphate inhibitors are no longer used in offshore operations. Treating concentrations for all these *types* are about the same, with 1-10 ppm usually providing satisfactory scale control. Higher concentrations may be required for more severe scaling tendencies. **Higher concentrations may be encountered in produced water after a squeeze treatment. However, squeeze treatments are unusual in U.S. offshore operations except for the few seawater floods.**

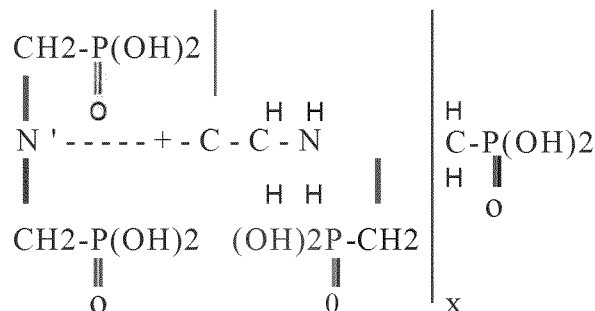
Phosphate esters. This generic chemical type contains the phosphate ester functional group, the carbon-oxygen-phosphorus linkage:



Typical phosphate structure

A variety of raw materials can be reacted with the phosphate **but** most *compounds* involve an amine nitrogen. The example shown is a disubstituted ethanamine. The selection of the raw material is based on the final effectiveness of the *compound* as a scale inhibitor and the cost of the raw material. The R groups may be identical or different. In many instances, the R groups will contain functional groups such as amine or alcohol which contribute to high water **solubility**. The acid groups are normally partially neutralized with caustic, ammonium hydroxide, or other inorganic base. **These materials** can not normally be used above 200F because the ester linkage hydrolyzes at high temperatures and the hydrolysis products are poor scale inhibitors.

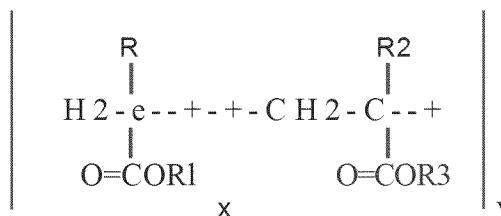
Phosphonates. The key functional group in this generic type is the direct carbon-phosphorus bond. Almost all of the raw materials contain amine groups, with the generalized structure being similar to that shown below:



Generalized phosphonate structure

Carlberg's²¹ studies on ethylene diamine tetra (methylene phosphonic acid), the active ingredient **in several commercial scale inhibitors, indicate further** that multiple active chemical functional groups can be present within the same compound.

Polymers. Acrylic acid polymers and/or copolymers are the normal base materials. The *compounds* have the generalized structure shown, where the Rs may all be different or identical. All the Rs are H in acrylic acid polymers.



Substituted acrylic acid copolymer

The scale inhibitor *compounds* are usually not modified by oxyalkylation, etc. as is common with emulsion breakers, as will be seen later.

Formulations can contain 10-50% active compound of one of these three generic chemical types in a water solvent. Ethylene glycol or methanol can be present from 0-20% to reduce the viscosity and/or to prevent freezing. There are normally no other additives. Some unreacted phosphoric and/or hydrochloric **acid** may be present also.

Solubility. All of the scale inhibitor *compounds* and additives are highly water soluble, in excess of 30-40%. The solubility or dispersibility in oil is extremely low. It is reasonable to expect that all of the

formulation produced from a well or added to the fluids on the surface will be separated from the oil in the separators or skim tanks and be retained in the aqueous phase except for that contained in the small amount of water emulsified in the oil phase.

Application. To work properly, scale inhibitor must be present in the water at effective concentrations when scale first starts to form. The minimum effective concentration is usually in the 3-10 ppm range but can be higher in severe cases. Only two application methods are used offshore - continuous injection or squeeze treatments. The scale inhibitor remains with the water phase in both methods.

In continuous injection, chemical is added with a pump at a constant dosage rate to achieve the desired concentration. In some instances, the chemical will be pumped down a small diameter capillary or macaroni tubing string to the bottom of the well to prevent scaling in the producing tubing as well as the surface equipment. Often, the scale inhibitor is added just upstream of the choke at the wellhead, which is especially effective against the most common scale, calcium carbonate. Alternately, the inhibitor will be added on the manifold if the problem is due to mixing of waters. Only the surface equipment is protected in the latter two methods but that is often the only problem area.

Squeeze treatments must be used when scale deposition is occurring in the producing formation, in perforations, in the wellbore below the tubing, or in the producing tubing string (when a macaroni string is not available). In squeeze treatments, a relatively large volume of scale inhibitor (diluted in water to 2-10%) is pumped into the formation, followed by more excess water. Some of the inhibitor is absorbed onto the formation surface and/or otherwise retained in the pores within the formation. When the well is returned to service, a part of the inhibitor is produced back quickly within a few days as a slug. The remainder is produced back slowly at much lower concentrations over a period ranging from two to twelve months, providing protection until the concentration drops to the 3-10 ppm minimum and the well is resqueezed.

Scaling problems have not been widespread in offshore operations for the operators interviewed, with most systems not requiring treatment. Fortunately, downhole scale problems are rare. Squeeze treatments are not common, with the operators having much concern about formation damage in the relatively unconsolidated Miocene sands in the Gulf of Mexico. One of the squeeze applications was in a gas well producing considerable formation water (an unusual situation). Normally, continuous treatment on the surface was only used in the water processing equipment in those cases where the scaling was serious enough to warrant continuous treatment.

Periodic (e.g., quarterly) removal of scale from flotation equipment was used in several instances.

CORROSION INHIBITORS

Problem Description. Control of corrosion is one of the most serious problems in offshore operations. Coatings, cathodic protection, and materials selection are used to control external corrosion, with corrosion inhibitors supplementing these same three methods for internal corrosion. All of the corrosion inhibitors used in treating produced fluids are organic compounds that form protective layers on the metal surface.

The use of various grades of low alloy carbon steel as the material of construction is an economic necessity for most of the production system. Different grades would be selected for fabricating vessels, tanks, or piping on the platform, with still other grades (primarily differing in strength level) being selected for pipeline and downhole tubular goods. All of these steels have very similar corrosion resistance with the exception that higher strength downhole tubular goods (and other high strength materials) can be susceptible to sulfide stress cracking. Small accessories such as instruments, valves, pumps, etc. are often fabricated from high alloys or have high alloy trim to prevent corrosion of critical surfaces which would impair the function. Vessels, tanks, flowlines, and downhole tubular goods can be coated to reduce the risk of rupture due to excessive metal loss over large areas. However, there is still concern about corrosion at defects in the coatings.

The corrosivity of produced fluids is usually related to dissolved gases - oxygen, hydrogen sulfide, and carbon dioxide. Produced fluids from the wells normally do not contain oxygen and every effort is made to keep air out of the treating equipment. Fortunately, the hydrogen sulfide content of produced fluids in most offshore fields is usually very low and H₂S is not a significant factor, providing that bacterial generation of H₂S is minimized. Production from recent developments in the Mobile Bay area does contain considerable hydrogen sulfide, with essentially all processing being performed onshore. Corrosion control and monitoring are very important design aspects of those systems. Carbon dioxide is the most common and serious corrodent, although naturally occurring organic acids can be a contributing factor.

The experience of the operators interviewed is that corrosion has been much less severe in oil wells than in gas wells probably due to the oil phase providing an inherent protective oily film on the steel. In both cases, corrosion is more likely to become a problem when water production increases.

Even if corrosion resistant alloys and/or coatings are utilized in parts of a system, corrosion inhibitors

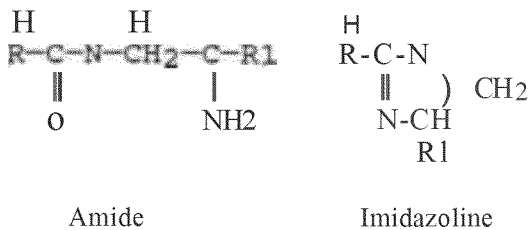
may still be required to protect some bare steel areas. By temporarily adsorbing onto the surface, **the** inhibitor can drastically reduce the corrosion rate, **often** by more than 90%. Hence, corrosion **inhibitors are** widely used in preventing or minimizing internal corrosion in offshore production systems.

Chemical Description. The corrosion inhibitors used in petroleum production operations generally contain nitrogen in **the** key functional group. The nitrogen-containing material is usually reacted with a carboxylic acid under different conditions to form a *compound* with properties optimized for various **types** of applications. While **the** carboxylic acid may have a low molecular weight for greater water solubility (e.g., acetic, propionic, or maleic), it is more frequently a complex mixture of higher molecular weight materials. Tall oil mixtures of variable compositions are often used, because of superior corrosion **inhibition** properties and low raw material cost. Table 2, from an NACE publication²² gives an **example of the** complexity of a **typical** carboxylic half of inhibitor *compounds*, with the nitrogen-containing half potentially having comparable complexity.

It is readily apparent **that** the corrosion inhibitor *compounds* are extremely complex mixtures. Further complicating the situation, different *compounds* can often be formed from the same raw materials by varying the reacting conditions, quite distinct from modifications such as ethoxylation. Testing of specific *compounds* and formulations is normally required to define inhibition properties but general **trends with molecular structures can be made**. Similarly toxicity testing is likewise normally conducted on defined *compounds* as intermediates or on final formulations.

Oilfield inhibitors can be grouped in several different fashions but a common generic chemical classification similar to Bregman's^{23,24} is useful for our purposes.

Amides/Imidazolines. Perhaps the single most common generic chemical type used in the petroleum industry is formed by condensing a long chain fatty acid with a primary amine, often a diamine or polyamine. The fatty acid is often derived from raw or refined tall oil and is composed primarily of fatty and resin acids as shown in Table 2. As an example, consider **that the** reacting amine is a substituted



(R1) ethylene diamine. The amide would be formed **under less severe conditions** (lower temperatures, shorter times, etc.) with the imidazoline predominate **under more severe conditions**. Some of each *compound* may be present as a product in a single batch reaction. An imidazoline can hydrolyze to the **corresponding amide on exposure to water under the proper conditions**.

Amines and Amine Salts. Amines (primarily monoamines) with long chains (e.g., C10-C15) also **have corrosion inhibiting properties**. However, better inhibitors can usually be obtained by reacting the amine with a long chain fatty acid (e.g., stearic acid), but often the dimer or trimer acid. Reaction conditions are milder than amide/imidazoline conditions and the salt is formed:



Oodecyl Amine

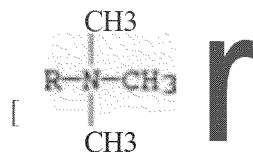
+



Oodecyl Ammonium Stearate

If **the** acid has a long tail of carbon atoms, ionization will be very slight and the inhibitor *compound* is essentially oil soluble. Water solubility can be substantially increased by using a low molecular weight acid (e.g., acetic acid) if the system pH is also low. Ethoxylating active sites increases the water solubility irrespective of the pH. Diamines and dicarboxylic acids can also be used.

Quaternary Ammonium Salts. Replacement of all of the hydrogen on the ammonia nitrogen with carbon or R groups results in a quaternary ammonium compound:




Trimethylalkyl ammonium chloride

In the example, a long chain amine (e.g., R is C15 mixture) is reacted with methyl chloride as the quaternizing agent. Other alkyl halides or mixtures can be used to obtain more complex quaternary ammonium *compounds*. All quaternary **ammonium** salts are highly ionized, with resulting high solubility in water and low solubility in oil. However, **ethoxylation is sometimes used to improve solubility in concentrated brines**.

Composition % by Gas Chromatographic Analysis ⁽¹⁾									
Fatty Acid	Caprylic	Capric	Lauric	Myristic	Palmitic	Stearic	Oleic	Linoleic	Linolenic
Carbon No.	8	10	12	14	16	18	18	18	18
Double Bonds	0	0	0	0	0	0	1	2	3
Source									
Coco	8	7	48	18	9	5	5	-	-
Soya	-	-	-	1	4	6	24	50	5
Tallow	-	-	-	3	27	17	47	4	1

Tall Oil	60-70% Fatty Acids, 30-40% Rosin Acids
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Rosin Acids⁽²⁾



Abietic Acid 25-35%

CH₃, COOH

CH₃,
CH₃,

Remaining Resin Acids are Abietic Acid Derivatives Shown Below					
Abietic Derivatives	%	Modification			
		Double Bond Isomerization	Hydrogenation	Dehydrogenation	Methylation
Pimaric acid	12-17	x			
Neoabietic	7-13	x			
Dehydroabietic	10-14			x	
Trihydroabietic	2-12		x		
Tetrahydroabietic	2-12		x		
Levopimaric	1	x			
Dextropimaric	3-13	x			x
Isodextropimaric	3-13	x			x

(1) Emery Industries, Specifications and Characteristics of Fatty Acids

(2) T. Uoyd-Jones, **Corrosion Inhibitors**, Cor. Prevo and Control, p.11 (1966) August.

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Table 2. Composition of fatty and rosin acids.

Nitrogen Heterocyclics. The nitrogen may also be incorporated into an aromatic or aliphatic ring structure. A typical example is pyridine, with substitution on the ring being possible also. The ring nitrogen in pyridine can be quaternarized, while aliphatic nitrogens may also form amides.

Formulations of corrosion inhibitors are among the most complicated of oilfield treating chemicals, perhaps second only to emulsion breakers. The total composition depends on the relative amounts of the fluids being treated (oil, water, and gas) as well as the nature of the corrodents (CO₂, H₂S, O₂, and/or organic acids). The presence of dissolved oxygen will sharply reduce the effectiveness of these inhibitors. Oil soluble inhibitors are used most frequently because they normally give better corrosion inhibition. The concentration of the *compound* is usually in the 30-40% range. A heavy aromatic naphtha

(HAN) refinery cut is a common solvent (40-60%), although other hydrocarbons can be used, depending on the *compound*. Oil *soluble* sulfonates can be included to improve oil dispersibility of *compounds* with limited oil solubility into a high gravity paraffinic crude for example. Dispersants such as nonyl phenol ethoxylates may be used to disperse the *compound* in high water-cut systems so the *compound* can be transported to the oil phase. Isopropyl alcohol, ethylene glycol, etc. may be added to reduce the pour point for cold weather applications. Emulsion breakers may be incorporated to minimize emulsion separation **problems**; similarly, antifoam chemicals may also be included. These latter two materials are added, especially if the inhibitor is primarily applied with batch, squeeze, or tubing displacement methods. They counteract effects of **high concentration inhibitor slugs, rather than**

treatment of ongoing emulsion or foaming problems.

Water soluble inhibitors may be used in water injection systems, gas transmission lines, and wet oil lines with high water content. Quaternary amines and amine (or amide) acetate salts are most commonly used. Compound concentration is in the 10-50% range, with water as the primary solvent (30-50%). Methyl or isopropyl alcohol may also be included (5-20%) to improve stability in the drum and/or low temperature handling characteristics. A surfactant (0-10%) such as nonyl phenol ethoxylate may be included to help the inhibitor reach the metal surface and to clean solids from the system. Water soluble inhibitors may be effective in gas systems where water may be produced or condensed and little hydrocarbon liquid is present. For gas gathering and trunk lines to shore, the corrosion inhibitor may consist of more than one type of compound: a quaternary ammonium salt for any liquid water that might collect and flow along the bottom, an amide "oil soluble" type for better long-term effectiveness, and even a low molecular weight amine (e.g., ethylene diamine) to neutralize some of the acid gases. Triethylene glycol or a similar solvent with low volatility is necessary in these gas lines to assure that the inhibitor formulation remains fluid and is carried along to shore.

Solubility. The distribution of corrosion inhibitors between the oil and water phases is highly variable. Most of the corrosion inhibitors used in the petroleum production offshore are oil soluble and are expected to follow the oil to the refinery. Some small fraction will be carried into the water in oil carryover but would constitute a negligible fraction of the allowable hydrocarbon concentration in the disposal water. On the other hand, the quaternary ammonium compounds would essentially all end up in the water phase.

Application. Different treatment methods are used to apply corrosion inhibitors in offshore operations.

Continuous treatments are used in some wells (especially gas wells) where a small diameter macaroni or capillary line is available²⁵, similar to the scale inhibitor. In fact, multipurpose scale and corrosion inhibitor formulations have been developed for this specific circumstance. Continuous treatments at the wellhead or surface facilities are also used if downhole corrosion is negligible and/or if supplemental surface protection is deemed necessary. If corrosivity measurements indicate protection is needed, water soluble inhibitors can be added continuously to waterflood injection water. Recommended treatments for waterfloods are typically in the 5-15 ppm range. Treatments for gas wells are usually higher, perhaps up to 100 ppm based on total

liquid production rate. Concentrations in the liquids may range up to a thousand ppm in unusual wells with very high gas volumes and very low liquid volumes. Some oil pipeline systems receive 10 ppm.

Displacement-type treatments are the most common method for downhole treatment of producing wells. With a liquid displacement for an oil well, a calculated volume of inhibitor (e.g., 55 gal) is diluted with sufficient hydrocarbon solvent (crude, diesel) to fill the tubing string down to the formation. The mixture is pumped in, allowed to contact the tubing for a short time, then produced back as the well is returned to service. With gas wells, the inhibitor may only be diluted to 5-10%, pumped in, and allowed to fall to the formation. The downtime for treatment and risk of killing the well with excessive hydrostatic head has led to increased use of nitrogen in the treatments. Typically, the concentrated inhibitor (perhaps slightly diluted with solvent) is atomized into a nitrogen stream and displaced to the formation face with more nitrogen. Displacement is usually much faster and the wells are usually returned to service almost immediately. In all types of displacement treatments, a substantial fraction of the inhibitor is retained on the tubing walls, with some part being produced at relatively high concentrations when the well is first returned to service. Experience of one operator indicated that only very minor amounts of the inhibitor were returned with the initial production after a treatment.

Squeeze treatments have also been used, similar to those described for scale inhibitors. The inhibitor is diluted to 5-10% in an organic solvent and injected into the formation. While there will be an initial return slug of several thousand ppm concentration in the oil for a day or two²⁶, most of the inhibitor is produced back at a much lower concentration (less than 100 ppm) over periods up to six months. Squeeze treatments are becoming less common because of concern for permeability damage around the wellbore, down-time, and risk of killing the wells.

Concentrations of the oil soluble inhibitors in the produced water discharged to the ocean are expected to be quite low and would be included in the total hydrocarbon measurement. The highest concentration in the discharged water would follow displacement or squeeze treatments. All wells on a platform or in the system will not be treated simultaneously for four reasons:

The treatments will normally be effective for different durations.

Treatment of all wells simultaneously causes major upsets in the separation equipment.

Sufficient equipment and operating personnel are not available.

Shutting in many wells simultaneously has an adverse effect on total production.

Typically, no more than 10-20% of the wells feeding into a separation system would be treated with a batch or squeeze treatment simultaneously. Thus, the peak concentration in the composite oil would only be a few hundred ppm. As an example, a carryover of 40 ppm of oil containing 500 ppm of inhibitor following a batch or squeeze treatment would only lead to 0.020 ppm inhibitor in the water. **Even** allowing a 20X concentration of the inhibitor due to possible accumulation at the oil/water emulsion interface, the concentration of 0.4 ppm is still very low, even prior to the immediate dilution at the point of discharge.

Oxygen Scavengers. One other type of chemical is **used in production operations to control corrosion.** Corrosion caused by dissolved oxygen in produced fluids is often controlled by reacting the oxygen with an oxygen scavenger. The scavenger does not form a protective layer. All of the scavengers in use are a form of sulfite, with ammonium bisulfite being commonly used offshore because it is available as a concentrated (60%) stable aqueous solution. The reaction with oxygen is:



The sulfate product is also highly water soluble, although the sulfate ion can react with high **concentrations of calcium, barium, or strontium to form a solid deposit.** Neither the scavenger nor the product will end up with the oil. At use concentrations (< 100 ppm added), neither the reactants nor the products pose any pollution risk to marine life (**seawater already contains** about 2700 ppm sulfate). Furthermore, the most important application is for treating injection waters, which are not normally discharged to the sea.

Corrosion inhibition practices for the four companies interviewed had similarities and differences. None were adding corrosion inhibitor to waterflood injection Water. Three did not normally treat oil wells downhole. However, one of these three did continuously add 10 ppm corrosion inhibitor to a large wet oil pipeline to shore, augmented by periodic batch treatment associated with pigging and biocide treatment. Another company regularly treated many of 150 oil wells feeding into a single pipeline (75-80% water), with 8-10 ppm of a water soluble corrosion inhibitor being continuously added to the line. Gas wells were treated on a selective basis by all operators, depending on results of corrosion monitoring programs and experience. Nitrogen displacement was becoming the preferred treatment method for one operator, but liquid displacements were more common for the other three. Squeeze treatments were being used in some instances but were becoming less common.

BIOCIDES

The purpose and use of biocides in the offshore petroleum **industry** has been previously discussed⁵⁻⁷. This section will review those papers briefly to add perspective to this paper. A few additional points will be included as well.

Problem Description. Of the various kinds of biological problems encountered in offshore production, sulfate reducing bacteria (SRB) are of primary concern. These bacteria reduce sulfate ion to hydrogen sulfide, which contributes to corrosion damage to the system and fouling of equipment with iron sulfide. The corrosion damage most commonly encountered is pitting of steel which can cause leaks and failures. Sulfide corrosion cracking can also lead to sudden catastrophic failure of high strength carbon steels and many high strength alloys. The iron sulfide presence increases the need for frequent vessel cleanout and also causes problems in oil and water separation. The iron sulfide particles become **oil-wet, stabilizing emulsions and making it more difficult** to obtain pipeline quality oil. Also, the oil carryover into the water is increased, making it more difficult to remove the oil from the water. Iron sulfide can spontaneously ignite if allowed to dry in the air, increasing the risk of **fire** during shutdowns, workovers, etc. SRB can also be a problem in pipelines connecting platforms or in the main pipelines to shore, especially since pitting corrosion can lead to oil leaks. Of course, hydrogen sulfide can be a severe safety hazard to operating personnel if vented or if contacted during maintenance of equipment. Control of bacterial growth can clearly be necessary for safe and efficient operations. Biocides were used from time to time on approximately one fourth of the platforms in the **Thirty Platform Study**⁴.

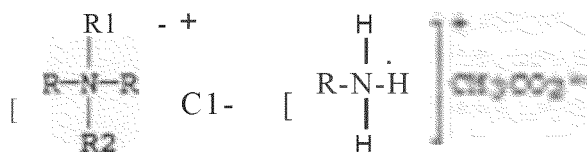
Biocides may also be required in waterflood operations to prevent SRB growths from causing corrosion of the equipment and/or plugging of the injection wells. Slug treatments are the normal treatment method, whether source wells or seawater is used. One aspect not considered in the EPA⁵ or API⁶ biocide survey papers is the treatment of seawater for injection (or utility) use. Such systems often use electrochemically generated sodium hypochlorite to control marine and microbial growth in the intake portions of the water treatment or utility systems handling aerated seawater. Dissolved oxygen must be removed from the seawater prior to injection in waterfloods by mechanical and/or chemical means. Since chemical oxygen scavengers also react with any residual hypochlorite, sulfate reducing bacteria then must be controlled with **organic** biocides in injection systems downstream of the treatment section to prevent corrosion and plugging of the reservoir rock. In either case

(source wells or seawater), essentially all of the biocide is injected into the formation.

Alternate biological control methods have had limited application, but chemical treatment has the best success ratio. Copper-based alloys can be used in some limited situations (e.g., intake screens) to reduce or prevent accumulations of marine growth but are economically and technically unsuited for most of the equipment. Removal of bacterial deposits can be difficult and is usually incomplete. Scraper pigs may remove most of the growths from pipelines, for example, but are usually used in conjunction with a biocide program to obtain more effective results when bacteria are known to be a problem.

Chemical Description. The biocides commonly used in offshore producing operations can be broken into four generic chemical types.

Quaternary amine salt and amine acetate. These two types of generic compounds are similar and have the following general structures:

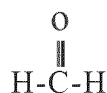


Quaternary amine salt

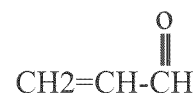
Amine acetate

The base amine may be a primary, secondary, or **tertiary** amine. One of the R groups is usually a long chain alkyl group, C10-C20. The other R groups are usually C1 or C2, formed by reacting with low molecular weight alkyl halides. The variation in chain length and ratios of the halides are the major modifications in the generic compounds. Quaternary amine compounds remain ionized and highly water soluble at all pH values. If there are three or fewer carbons bonded to the **nitrogen**, an amine salt can be formed by reaction with an acid, e.g., acetic acid in the example shown. The salt is ionized at low pH, but the N-H bond breaks at higher pH, forming the free amine, which is less water soluble and usually less effective as a bactericide. The formulations of these amine salts are usually relatively simple, a 10-50% solution of compound in water. Alcohols may be added for freeze protection or viscosity reduction.

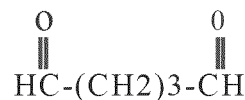
Aldehydes. Three types of aldehydes are used as biocides in the oilfield. These materials are much purer than most other oilfield treating chemicals, with well defined properties. All are highly water soluble and very reactive chemically. The formulations usually contain an inhibitor to prevent polymerization. Formaldehyde and glutaraldehyde are sold as 20-50% concentrated aqueous solutions. The acrolein is sold as an anhydrous liquefied gas under a pressurized nitrogen blanket and is fed directly



Formaldehyde



Acrolein



Glutaraldehyde

from the cylinders. It should be noted that use of formaldehyde and acrolein has decreased in the last two years due to concerns for personnel safety.

Other. Organic-sulfur compounds such as thiocarbamates, isothiazolin, etc. and one halogenated organic compound (2,2 dibromo-3-nitrilo-propionamide) are used in offshore producing systems to some extent. The use of electrolytically generated sodium hypochlorite in seawater systems has already been mentioned.

Solubility. The biocides are all highly water soluble, with very limited solubility in the oil. Hence, the biocides are expected to remain with the water.

Application. Biocides are used in production operations to minimize operating problems by controlling growth. It is not feasible nor is it necessary to obtain a completely sterile system. Experience through the years has shown that short periodic slug treatments at higher concentrations are technically and economically more effective in maintaining biological control inside the system than continuous treatment at lower concentrations. Less biocide is used; hence, less is discharged to the ocean. Slug treatments are optimized for each system but a typical program includes concentrations in the 100-200 ppm range for 2-6 hours on a weekly to biweekly basis. Thus, average usage for a 150 ppm, 4 hour weekly slug would be 4 ppm, compared to 10-20 ppm requirement for continuous treatment. More frequent slug treatments may be required to obtain control initially but rarely more than every other day. Hypochlorite used in seawater systems is added continuously, with 0.5 ppm residual usually being sufficient to control marine and microbiological growth.

Essentially all of the biocide used in waterflooding is injected into the formation with the water. Little or none will be discharged to the ocean. Because of reactivity and adsorption on surfaces in the reservoir, none of the biocide is expected to reach the producing wells.

All of the four operating companies used biocide to some extent, but only in response to problems

detected by operations personnel and/or monitoring programs (HzS increase, high SRB concentrations, FeS, etc). None of the operators treated wells downhole, although one indicated that flowlines from remote single well jackets were slug treated weekly (100 ppm for a couple of hours) on an as-needed basis. Treatment on the platforms was usually restricted to the water processing equipment, again in response to problems or monitoring. One wet oil pipeline to shore receives a weekly 4 hour slug of glutaraldehyde (50 ppm, active basis) in conjunction with pigging. In another wet oil line, only the water processing equipment on shore is slug treated with 100 ppm acrolein⁶. No acrolein was detected in the discharge from the facility due to dilution and reaction. Biocides were not normally required on any platforms in gas fields.

EMULSION BREAKERS

Problem Description. Virtually all of the oil production in offshore operations contains produced water and **dissolved** or free gas. Major parts of the offshore facilities are involved in separating these three phases. Separation of the gas from the oil and water is relatively straightforward, although foaming can be a problem. As mentioned earlier, most of the gas wells produce very little water, with the liquid hydrocarbon being easily separated from the gas.

Separation of the oil and water in oil fields is usually a more difficult task. While systems vary widely depending on the nature and age of the producing wells, **two** or more stages of separation are common. Most of the gas is removed in the **high pressure separator**, with the water and oil both **being** sent to the intermediate (or low pressure) separator through the same line, usually in an emulsified form. With a low water cut, water droplets are dispersed in the continuous oil phase, called a normal emulsion. At high water cuts the oil droplet is suspended in the **continuous water phase, called a reverse emulsion**. Oil and water are not miscible and normally will rapidly separate if some type of emulsifying agent is not present. Naturally occurring constituents of the produced fluids such as asphaltenes, resins, organic acids, clays, etc. can stabilize emulsions, as can **certain materials such as corrosion inhibitors, biocides, or corrosion products** that are introduced during producing operations. The emulsifying agents concentrate at the oil/water interface, preventing dispersed droplets from coalescing and separating.

The oil entering the low pressure separator usually contains some free water plus dispersed droplets of water, stabilized to some extent by emulsifying agents. Free water is removed in the low pressure separator (or FWKO) and the oil flows to the bulk oil treater. This oil is treated to pipeline specifications in the treater. Oily water and any wet

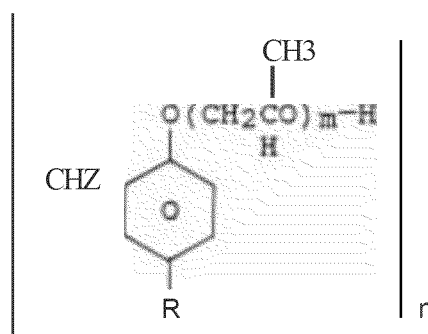
oil is sent to other systems for further treatment.

Separation of the emulsified water from the oil in the treater can be improved with longer residence times, warmer fluid temperatures, electric fields, and/or chemical additives called emulsion breakers or demulsifiers. **Excessive residence time is not** economically feasible because of the high cost of space and weight on offshore structures, especially in deeper water. The produced fluids are commonly heated in direct fired heater-treaters in onshore systems, but the increased risks associated with fire on an offshore structure makes this approach less desirable. Electrostatic fields in the treater are used extensively to improve separation, but it is still often necessary to use an emulsion breaker. Separation of water from very light oils and gas condensate is usually much easier; electrostatic separation is rarely used and emulsion breakers may not be needed.

Emulsion breakers work by attacking the droplet interface. They may cause the dispersed droplets to aggregate intact (flocculation) or to rupture and coalesce into larger droplets. Either way, the density difference between the oil and water then causes the two liquid phases to separate more rapidly. In addition, solids present will usually tend to accumulate at the liquid level interface (between the bulk oil and water phases) and form a semi-solid mass. If these solids are not dispersed **into** the oil phase or water-wetted and removed with the water, the interface detector in the control system will ultimately malfunction, causing water to be dumped into the oil pipeline or oil to be carried over to the produced water system. Proper selection and application of **emulsion breaker will minimize this accumulation** and the resulting problems.

Chemical Description. Several different generic chemical *compounds* are used in emulsion breakers. Usually there are two or more *compounds* involved in any formulation.

Oxalkylated Resins. The resins are usually alkyl phenol formaldehyde types, with R, m, and n being

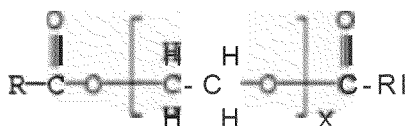


Alkyl phenol formaldehyde resin

R = C₄ - C₁₂ , n = 7-12 , m = 1 to large

varied. The phenolic hydrogens are essentially all oxyalkylated, usually with ethylene and/or propylene oxide. Propylene oxide is used in the example. Variation of n and m govern the oil solubility and wetting characteristics of the *compound*.

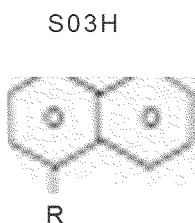
Polyglycol esters. Glycols such as ethylene glycol, di- or tri-ethylene glycol, glycerine, etc. are reacted with alkyl carboxylic acids to obtain the desired properties. Using polyethylene glycol as an example:



Dialkyl polyethylene glycol

Variation of R and R1 governs the solubilities but the *compounds* used are all much more soluble in oil than in water. These *compounds* can also be modified by esterifying with dibasic acids (e.g., maleic anhydride) to form even higher molecular weight esters.

Alkyl Aryl Sulfonates. The third major type of *compound* used in demulsifiers are the sulfonates, frequently a substituted naphthalene sulfonate:



Substituted naphthalene sulfonate

The R group is usually a straight chain group. The *compounds* are similar to the dodecyl benzene sulfonate used in many household detergents but have different alkyl or aryl substitutions for higher oil and lower water solubilities.

There are a few other different types of *compounds* that are occasionally used but the above types probably constitute 95+% of those used in offshore operations.

Formulations. Probably 90-95% of the product formulations used in the oilfields will consist of mixtures of two or more of the above *compounds*. There may be **two** *compounds* from the same generic type or *compounds* from different generic types. Mixtures are usually required to obtain the best balance of reaction speed, cleanliness of oil, and clarity of water. In addition to these generic types,

many formulations also include a water soluble wetting agent. Probably the most commonly used *compound* is the sodium or ammonium salt of dodecyl benzene sulfonic acid, the household detergent mentioned earlier. Ethoxylated nonyl phenol, another surfactant, is also used. The base solvent for virtually all of the demulsifiers is a heavy aromatic naphtha cut. Methyl alcohol, isopropyl alcohol, or similar solvents are used to obtain stability in the drum and/or freeze protection or viscosity reduction for cold weather applications.

Formulations will usually contain **30-50%** total of the various demulsifier *compounds*. The bulk of the remainder will be the heavy aromatic naphtha. The wetting agent (e.g., dodecylbenzene sulfonate) is a very minor constituent (e.g., <0.01%) used to help the demulsifier migrate through water into the oil phase. This migration is especially important in wells producing a high percentage of water. When alcohols are added for freeze protection, the *compound* concentrations may drop below the 30% normal lower limit.

Solubility. The three primary demulsifier *compounds* listed are all highly oil soluble as is the aromatic solvent. Very little of these *compounds* will remain in the water phase except as a contaminant in oil carryover as described for the corrosion inhibitors. The alkyl aryl sulfonates would probably have the highest water solubility. One vendor had data for one crude oil indicating that 92% of a formulation containing only this generic type of *compound* went into the oil, with only 8% (including the methyl and isopropyl alcohol cosolvents) of the formulation going into the water.

Application. During normal operations, demulsifiers are added continuously, either upstream of the low pressure separator (or FWKO) or just before the treater. Concentrations (based on oil production rate) range from 10 to 200 ppm, with most treatments requiring less than 30 ppm. The higher concentrations would usually only be required to **cope with an abnormal situation, such as a well workover**, where unusually high solids concentrations help to stabilize emulsions. High concentrations of other **treating** chemicals (e.g., corrosion inhibitors) can increase emulsion stability also, but **some emulsion breaker is often incorporated into those formulations to minimize the emulsification tendencies.**

Treating concentrations based on total oil and water production will obviously be lower, depending on the water cut. A normal maximum of 50 ppm (oil) would be 25 ppm (total) if an equal volume of water were produced. If 90% goes with the oil, only 5 ppm of total formulation would be present in the **water.**

REVERSE BREAKERS

Problem Description. After the primary oil-water separation occurs, some finely dispersed oil may be carried along with the water as an oil-in-water emulsion, commonly called a reverse emulsion in the oilfield. It is usually necessary to clean up this water before it is discharged to the ocean or injected into a waterflood or disposal well. The oil itself must be reduced to approximately 48 mg/l for overboard disposal. While the oil may directly contribute to injection problems, the solids frequently associated with the oil will cause plugging of formations. The injection rate will then decrease, the required pressure will increase (higher fuel consumption) or the well must be worked over (acidized, backflowed, underreamed, redrilled, etc.) to maintain injectivity.

Probably the most common offshore produced water treating systems include efficient gravity settlers (e.g., corrugated plate interceptors, CPI) and/or flotation cells, although many systems may also have a small surge/skim tank as well. The tank (if present) allows "free" oil and gas to separate from the water, easing the load on the downstream equipment. The CPI units provide better separation because the plates drastically reduce turbulence, allowing smaller droplets to separate, coalesce, and migrate to the surface for skimming. In many systems with condensate or light oil, the CPI unit alone will suffice for oil removal for overboard disposal, often without chemical treatment. However, reverse breakers can be added to facilitate gravity separation in the skim tank and CPI units. For heavier oils, many operators have found that flotation equipment is the most effective approach. A second chemical or a different formulation may be required to obtain maximum efficiency in the flotation cell. Granular media filters may also be used for removal of oil and solids, especially if the produced water is to be injected. Different generic types or formulations of treating chemicals may be required for this equipment (See F). Filters have not been used extensively in offshore produced water treatment because of the extra space and weight requirements for cleanup of the backwash water (as compared to CPI and/or flotation cells).

Chemical Description. Most of the oil droplets in reverse emulsions have a net negative charge. Hence the treating chemicals usually will have positive charges to neutralize the droplet charge and cause particles to aggregate. The reverse breaker compound will have surfactant properties to reduce the interfacial tension, allowing the oil droplets to coalesce into large drops.

Polvamines. Low molecular weight amines or mixtures of amines are moderately polymerized to make these compounds.



Simple polyamine

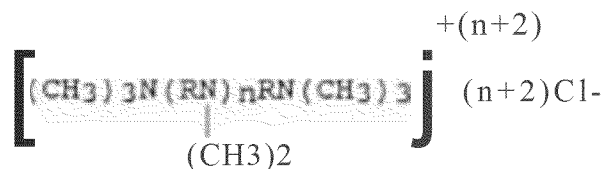


Mixed polyamine

The R and R₁ groups may have 2-8 carbon atoms to vary the charge density, with the molecular weight of the polymer usually in the 2000-5000 range. In some instances, the R groups are crosslinked to form a more compact compound structure. The compounds are usually present in the salt form in the drum (halide, acetate).

The reverse breaker compounds are distinguished from the coagulants in the following section primarily by modification to provide surface tension lowering properties. This property is usually obtained by reaction with a long chain fatty acid to form either an amide or an ester, but may also be obtained by oxyalkylation. Only a small weight fraction of the compound (e.g., 5-10%) will be modified, as too much reduction in surface tension can either stabilize or form emulsions during usage.

Polvamine Quaternary Comounds. Virtually any of the above polyamines can be quaternarized with methyl chloride or other desired agents to obtain the corresponding quaternary ammonium halide:



These two generic types comprise most of the reverse breakers used. Many of the coagulants and flocculants discussed in the following section contain similar compounds and sometimes are also used to aid in oil removal as well as the combined removal of oil and suspended solids.

Formulations usually consist of 20-40% of compound in water solvent. Metal salts (aluminum, iron, or zinc chloride) may be included in the formulation in some instances, as discussed under coagulants. Methyl or isopropyl alcohol is used for viscosity reduction or freeze protection when appropriate.

Solubility. The quaternary ammonium compounds are all highly soluble in water, with very little being carried into the oil except through water carryover. The polyamines are highly soluble in water at low pH, but oil solubility will increase at higher pH

values. The exact distributioo between the phases will depend on the specific *compound*, but *compounds* with smaller R chains and more amino nitrogens per molecule (higher charge density) will be more water soluble at any given pH. If the produced water pH is as high as 8, quaternary ammonium *compounds* will generally provide greater efficiency at lower costs. Some of both types of *compounds* will accumulate on the surface of oil droplets and be skimmed with the oil.

Application. Reverse breakers are usually added continuously to the water leaving the low pressure separator and/or treater before it enters the water cleanup system. Concentrations will vary with the difficulty of breaking the reverse emulsion but 5-15 ppm based on the water flow rate is typical. Over-treating is both technically and ecooomically undesirable. Excess breaker often can cause re-emulsification.

COAGULANTS AND FLOCCULANTS

These materials are chemically similar to the reverse breakers but generally do not cause lowering of the surface tension. They are primarily used for removal of solids from injection water but may also be used to improve oil removal for overboard discharge. Nomenclature varies between the supplier and operating companies interviewed.

Problem Description. Suspended solids in water can cause plugging problems in injection or disposal wells. These solids can also stabilize both normal **and reverse emulsions, making it more difficult to** obtain saleable oil and/or properly treated water. Reverse breakers are primarily used to clean up oily produced water for discharge, but a coagulant (and/or flocculant) may be required to get the solids **concentration down to very low levels to prevent** injection well plugging.

Chemical Description. The coagulants have the **same generic chemical descriptioa as the cationic** polymers commonly used for the reverse breakers: low molecular weight polyamines or quaternarized polyamines. Little or no modification is made to the basic structure. The high charge density provided by amine groups on short chains allows efficient neutralization of the negatively charged solid particles and some growth into larger particles. Aluminum, iron, and zinc chlorides can also be used as coagulants. These materials work by precipitation, with the precipitate both oeutralizing and entrapping suspended solids particles.

Coagulant formulations may be solely polymers (typically 20-30% active in water), inorganic salts (20-50% active), or mixtures (primarily inorganic

salts with 5-10% polymer). Water is the solvent, but methyl or isopropyl alcohol can be added to the polymers for freeze protection.

The flocculants are very high molecular weight polymers. Cationic types are the most common but **anionic and non-ionic are available. The molecular** weights are in the 0.5 to 20 million range, a hundred to a thousand times higher than the coagulants. The charge density is much lower than the coagulants as well. These materials help solids removal by bridging between particles or aggregates of particles, with relatively minor neutralization of charges. The drastic difference in molecular weight and charge density is obtained by adding a few active sites to a relatively large inert polymer. For example, a high molecular weight phenol-formaldehyde resin can be formed with sufficient ethoxylation to maintain water "solubility". A few amine groups (salt or quaternary ammonium form) can be added to form a cationic polymer, or a few carboxylic acid groups added to form an anionic polymer. Formulations are in the 10-30% active range.

Solubility. The coagulants and flocculants are all highly water soluble with very little expected to be **carried into the oil except as an impurity in emulsified** water. In most applications, however, these agents would become rather tightly attached to the particles, becoming essentially insoluble in either the water or oil. They would then follow the solids.

Application. Coagulants can be added to speed up gravity separation in a tank or CPI unit or improve the performance of a granular media filter. Typical treatment concentrations for settling are in the 5-10 ppm range. Treatments below 1 ppm have been effective in the filtration of relatively clean (1-10 ppm TSS) seawater (North Sea, Arabian Gulf, California, etc.), but higher concentrations may be required with higher suspended solids concentrations (e.g., in the Cook Inlet when glacial silt concentrations may reach 1000 ppm TSS during spring runoff).

Flocculants are usually more economically and technically effective when the original suspended solids consists of relatively few large particles or after a coagulant has been used to aggregate most of the small particles. For example, the original, small, negatively charged particles could be neutralized into a few positively charged aggregates by a **moderate overtreatment with a cationic coagulant. The** aggregates could then be further bridged into very **large aggregates with an anionic flocculant to cause** rapid settling in a tank or CPI unit. Flocculants can also be used to aid in removal of oil from oil-coated sands.

None of the operators interviewed were using coagulants or flocculants in treating of injection

water. Some of the operating personnel felt that the chemicals added upstream of the flotation units were best classified as coagulants or flocculants as opposed to reverse breakers.

ANTIFOAM

Problem Description. Foaming can be a significant problem in separation of gas from liquids in both high and low pressure separators. Excessive liquid carryover into the gas can cause problems in downstream compression and/or gas processing equipment. Inlet scrubbers installed to protect such equipment are usually sized to catch minor amounts of spray, not large quantities of foam.

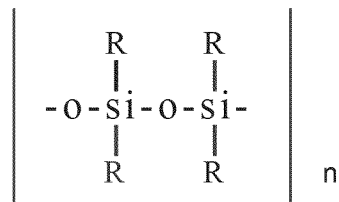
Foaming problems can be reduced by decreasing the throughput, increasing the operating pressure, or adding an antifoam chemical. Decreasing the flow through the separators would decrease total production which could have serious economic and technical implications. Maintaining a higher operating pressure on the high pressure separator would reduce the amount of gas released and the volume of gas in the vapor phase, thereby providing more time for the foam to collapse. However, the higher pressure may decrease the production from the lowest pressure wells and will increase the volume of gas to be handled in the low pressure separator. The change will also affect the amount of condensate in the **gas** phase.

Addition of antifoam chemicals (usually upstream of the high pressure separator) can drastically reduce both the quantity and stability of the foam. Besides eliminating possible restrictions in production rates and/or **gas** processing problems caused by foam, the separator operating pressures can then be adjusted to obtain the most efficient distribution of condensate liquids.

Foaming can be a problem and a benefit in water processing. Foaming can adversely affect vacuum deaerators, significantly reducing oxygen removal efficiency. Some foam is helpful in removal of suspended solids and oil in flotation cells, but excessive foam is detrimental to both the original separation and subsequent handling of the waste stream from the unit.

Chemical Description. Two generic types of *compounds* are used as antifoams: silicones and polyglycol esters. Variations of both types can be used in either hydrocarbon or water processing. The *compounds* work by accumulating at the gas/liquid interface and disrupting the foam layer and must have low solubility in the liquid phase to function in this manner.

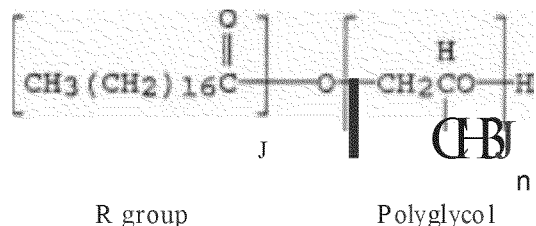
Silicones. This class of chemicals is based on silicon, often with substitution of carbon-based organic radicals on the silicon atom.



The degree of polymerization (*n*) can be varied as well as the organic group *R* on the silicon. Larger values of *n* and larger *R* groups increase the molecular size and the viscosity, which is often used to characterize the basic *compound*.

Lower molecular weight silicones with low viscosities may be sold and applied as pure *compounds* without a solvent. Mixtures of *compounds* also can be blended for optimum efficiency for specific applications. Some formulations use a hydrocarbon solvent to lower the *viscosity* of a high molecular weight silicone for easier handling and pumping. Colloidal silica (e.g., extremely small particles of sand) is included in some formulations to improve the effectiveness of the silicone. Finally, emulsions of silicones in water (with or without colloidal silica) are available for use in water-based systems. A surfactant and sometimes an alcohol are required to maintain emulsion stability in the drum.

Polyglycol esters. These materials are obtained by reacting fatty acids (e.g., stearic acid) with a relatively high molecular weight polyglycol. Using polypropylene glycol and stearic acid as the *R* group:



A surfactant is often included in the formulation to improve dispersibility of the *compound* in the liquid phase. The surfactant may be different depending on whether the liquid phase is primarily hydrocarbon or water. Methyl or isopropyl alcohol may also be included in the formulation to improve stability in the drum and/or provide freeze protection.

Solubility. The antifoam *compounds* have very limited solubility in either hydrocarbon or water. The formulation would usually be diluted with hydrocarbon before injection in production separators to improve dispersion into the stream. Since the water phase is below the oil/gas interface where foaming occurs, most of the antifoam *compound* will go with the oil phase, even though it is not soluble in the oil. Emulsified silicones and/or polyglycols used

in deaeration towers obviously carry along **with** the water and are injected. The *compound* used in a flotation system mostly goes with the oily froth, ultimately following the oil to sales.

Application. The antifoam *compound* must be added continuously to control foam. The required **concentration for production systems can range** from a few ppm up to about 25 ppm. Substantially lower concentrations have proven effective in seawater vacuum deaerators, about 0.2 ppm of both generic types^{27,28}. Thorough dispersion of the formulation into the main process stream is necessary for optimum effectiveness. Predilution in kerosine, diesel, water, etc. is a commonly used method to aid mixing, but care is required to assure that separation does not occur in the intermediate dilution stream.

The operating companies interviewed had encountered very few foaming problems that warranted treatment **with** antifoam chemicals. No more than a half dozen production separators (total) required treatment in all of their operations. One operator reported they used antifoam occasionally on flotation cells.

SURFAcrANTS

Problem Description. Surfactants are widely used in offshore operations to remove small amounts of oil or grease from the platform and/or equipment. Accumulations of hydrocarbon would undoubtedly increase the risk of damage due to fires. Oily deck surfaces or equipment can become extremely slippery and will lead to injury to personnel. The Minerals Management Service (MMS) requires that all offshore facilities be washed down regularly to minimize these potential hazards. Surfactants are also used to remove oil films prior to touchup painting, although sandblasting may be required in many instances.

10 some instances, surfactants are used to aid in mitigating corrosion and/or bacterial problems in systems. The surfactant supplements the detergent properties of the inhibitor and/or biocide to allow those *compounds* to penetrate to the metal surface and may also help dislodge deposits from tubing, pipelines, or vessels.

Surfactants may also be needed to clean up granular media **filters** that have become contaminated with oil, solid hydrocarbon deposits, and occasionally even non-hydrocarbon materials. Such **treatments are usually not required on seawater** filters because hydrocarbon contamination is extremely rare. In a similar application, surfactants may be used to water-wet produced sand and/or clays, releasing the oil for recovery and allowing discharge of oil-free **solids** to the ocean.

Chemical Description. Both of the commonly used types of surfactant *compounds* are widely used in other industrial and domestic applications.

Alkyl aryl sulfonates. This generic type of **compound** is an anionic surfactant, usually in the neutralized form:



The example shown, dodecyl benzene sulfonate, illustrates the common structure of the alkyl group, a moderately long straight alkane. The chain lengths of any *compound* **will** vary somewhat, and different average lengths may be used to obtain somewhat different properties. Numerous **earlier** studies have shown that the straight chain was biologically degraded far more quickly and extensively than branched chains. The higher molecular weight sulfonates described under Emulsion Breakers are usually not used as surfactants for system cleanup.

Formulations are usually concentrated solutions of *compounds* in water.

Ethoxylated Alkyl phenols. These materials are formed by ethoxylating phenol or substituted phenols.



The size of the R group (a straight chain alkane **with** 6 to 18 carbons) and the degree of ethoxylation (n) controls the solubility of the surfactants. A large R and a moderate n allows the surfactant to be soluble in hydrocarbon for certain applications (e.g., cleaning storage tanks or vessels) yet be highly water dispersible for washdown purposes. A smaller R group and/or more ethoxylation allows the surfactant to be highly water soluble and easily diluted and/or applied with water. Onyl phenol is widely used because it is readily available, low in cost, and easily modified to achieve the desired properties.

Formulations can vary substantially, depending on the purpose. One oil-soluble version is available **with** 2-20% surfactant in hydrocarbon solvent to facilitate tank/vessel cleanout. Water soluble versions are available as more concentrated forms (20-50% *compound*) in water, **with** alcohols or ethylene glycol added for solvency and/or pour point depression.

Solubility. As discussed earlier, the sulfonates are water soluble while the phenol-based materials can be made oil soluble and water dispersible as well as water soluble. Oil soluble surfactants used to clean

tanks are drained or pumped directly to the oil stream and would probably continue with the oil to the **refinery**. Otherwise, the surfactants would be expected to go with water into the processing stream. Some of this surfactant would be expected to move with dislodged oil back to the oil stream from the CPI or flotation **cell**, but most of the water soluble surfactant would remain in the water phase and be discharged to the sea.

Application. Process applications require low concentrations (5-25 ppm) to alter the surface tension and water-wet produced sand for example. Treatment to clean up an oil/water interface emulsion **stabilized** by solids is usually a batch operation, with the emulsion breaker treatment preferably being altered to prevent a frequent recurrence. Similarly, cleanup of contaminated **filters** is usually a batch process not involving continuous addition of surfactant.

Housekeeping cleanup of the external surface of equipment and the platform itself probably involves as many procedures as there are housekeepers. In principle, a 1-10% dilution of surfactant in water is wiped, sprayed, mopped, brushed, etc. onto the surface and allowed to soak. Subsequently, the surface is hosed down with copious amounts of seawater, sometimes followed by a freshwater rinse. The surfactant would be drastically diluted, but it would be **difficult** to impossible to give probable ranges. After the released oil is separated in the sump, the water is discharged to the ocean.

None of the operators continuously added surfactant to any process stream nor did any have media **filters** in service which might require cleanup. Surfactants were used on an as-needed basis (not a common occurrence) for cleanup of oil wet solids and/or disposal of the interface in separators. Various surfactants and cleaners are frequently used for housekeeping and maintenance purposes.

PARAFFIN TREATING CHEMICALS

Problem Description. The liquid hydrocarbon phase produced from many reservoirs becomes unstable after it leaves the formation. Decreasing pressure and temperature causes a solid hydrocarbon to deposit on the walls of the tubing, flow lines and surface equipment. The deposits will progressively block flow through piping and fill **process** vessels and tanks. Excessive deposits can interfere with operation of valves and instrumentation.

The composition of this solid depends on the original oil composition, but it is usually called *paraffin* in the oilfield. Straight or branched chain hydrocarbons, similar to the paraffin homologous series defined by chemists, are usually deposited from paraffinic crudes. Polynuclear aromatic hydrocar-

bons, sometimes referred to as asphaltenes, are usually deposited from asphaltic or aromatic crudes. These various solid deposits have different solubilities in organic solvents. Unfortunately, *paraffin* deposits are so complex that no calculation methods exist to predict when they will deposit. Experience in the field with similar crudes is the best method to anticipate problems. Deposition of *paraffin* from fresh, pressurized bottom hole samples can be a useful indicator also.

Physical methods can be used to control *paraffin* problems in many instances. **Scrapers** and 'pigs' can be pumped through flow lines and pipelines, pushing accumulated deposits before them. Pumping **hot** oil through lines is a common remedial method onshore, but is less common offshore because of safety concerns. Thermal insulation for subsea lines and platform piping will reduce the deposition rate and sometimes prevent any deposition under normal operating conditions.

Chemical methods are used alone or in combination with physical methods. Solvents can be used to dissolve the *paraffin* or keep it in solution. Continuous addition of solvent to the total production stream is often prohibitively expensive. However, solvents are frequently used to remove *paraffin* during workovers involving acidizing, gravel packing, etc. *Paraffin* inhibitors can be effective in preventing the solid particles from aggregating or depositing on the walls of the piping and equipment.

Chemical Description. Solvents used to control are normally impure refinery cuts for economic reasons. The paraffinic or aromatic nature of the solvent is selected to obtain maximum solubility of the *paraffin*. Cuts approximating xylene mixtures are the closest to a **definable** structure.

Chemical suppliers submitted information on three types of *compounds* used as *paraffin* inhibitors. The available information is not considered sufficiently defined to show structures. The three types are vinyl polymers, sulfonate salts, and mixtures of alkyl polyethers and aryl polyethers.

Solubility. The solvents and inhibitors are all highly soluble in oil, with very limited solubility in water. Consequently, it is expected that almost all of the *paraffin* chemicals will remain in the oil phase.

Application. **Paraffin** solvents are used in batch treatments occasionally in offshore systems to aid in cleaning out lines or vessels. Some operators have used a small batch (50-100 gallons) in front of pigs to aid in paraffin removal or help soften deposits if the pig becomes stuck.

Paraffin inhibitors are used more commonly and **are added continuously**. **Treatment concentrations** are usually in the 50-300 ppm range, based on oil

production. Crudes with mild to moderate paraffin deposition tendencies may require treatment only during the winter months when air and water temperatures are lower.

SOLVENTS AND ADDITIVES

This section is concerned with components of the formulations that are not related to the functional use or uses of the chemical, primarily solvents and some surfactants.

Solvents. Hydrocarbon solvents are used with those chemicals that usually end up in the oil phase - emulsion breakers, oil-soluble corrosion inhibitors, and anti-foam chemicals. In all instances, this solvent is a complex refinery cut, not a simple compound. "Heavy aromatic naphtha" is the term most commonly used by the suppliers, emphasizing the key requirements. The aromaticity enhances the solvent properties of the naphtha cut with respect to the various chemical compounds, while the "heavy" reflects the high molecular weight and low volatility needed to meet flash point restrictions for safe handling.

These solvents all have very high solubility in the oil phase and very low solubility in the water. Essentially all of the hydrocarbon solvent is expected to go with the oil.

Other Solvents. Methyl and isopropyl alcohols are the most common other organic solvents. As pointed out earlier, their primary purposes are to provide lower viscosity or freeze protection in the drum. While both are completely soluble in water in all proportions, they also have substantial solubility in hydrocarbons. Consequently, they are also incorporated into some formulations to obtain a completely miscible stable formulation in the drum. Miscibility can be a particularly important aspect in multipurpose formulations, such as one containing a corrosion inhibitor, biocide, and scale inhibitor. Glycerine and low molecular weight glycols are also used in some formulations. It is expected that these solvents will primarily end up in the water phase in most applications.

Surfactants. Relatively small amounts of surfactants are incorporated into some formulations to increase stability and dispersibility in the drum, with less than one percent being adequate in most cases. In other formulations, surfactant may be added in comparable or slightly higher concentrations to improve the performance of the primary compound. For example, surfactant may be added to help the corrosion inhibitor penetrate to the pipe surface. Chemically, the surfactants are similar or identical to those described previously.

GAS PROCESSING CHEMICALS

HYDRATE INHIBITION CHEMICALS

Natural Gas Hydrates. Natural gas hydrates are ice-like solids that can form in natural gas in the presence of liquid water under certain conditions. These solid deposits can form at temperatures well above 32F, even above BOF. Hydrates can block flow of fluids and cause rupture of pipe, fittings, or valves. Chunks of hydrates moving through piping can cause catastrophic failures at elbows or tees. Compressors can be destroyed by the impact of pieces of solids, including hydrates. Clearly, hydrates can be a severe problem in producing or shipping natural gas. However, hydrates frequently are not encountered in shallow waters in Gulf of Mexico operations. Deeper waters are expected to be more severe, as are the colder West Coast and Alaskan waters.

Numerous factors affect the temperature at which the solid hydrates will form. Hydrates form at higher temperatures if the pressure is higher and the gas contains more ethane, propane and butane. Figure 4 from an early publication²⁹ shows these trends. These curves indicate that hydrates should be expected above 3000 psia if the temperature of most natural gases drops below about 75F. Most gas wellhead pressures in the Gulf of Mexico are above this value for much of the producing life of the well. However, the situation is complicated if carbon dioxide or hydrogen sulfide is present in significant

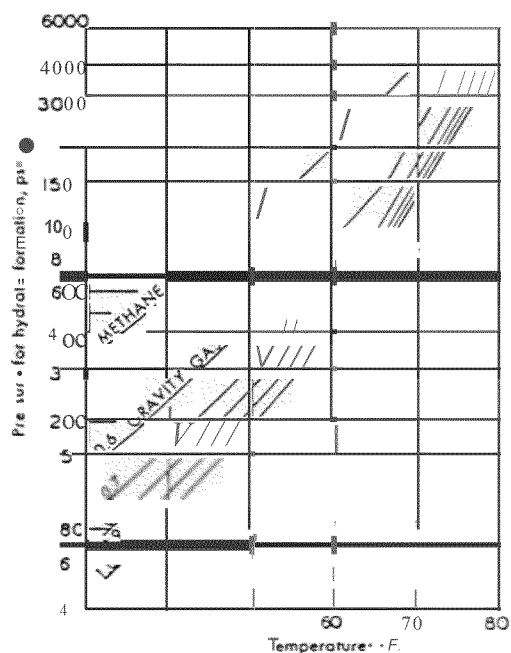


Figure 4. Conditions favorable for formation of natural gas/ freshwater hydrates.

concentrations. These gases allow hydrates to form at even higher temperatures. On the other hand, **high** concentrations of salts or other materials dissolved in **the** water depress the hydrate temperature considerably.

Temperatures below 75F are not uncommon. Surface water temperatures in the Gulf of Mexico range from about 65F in February to about 85F in August³⁰. However, it is the development of deep-water prospects **that is** currently of greatest concern to operators in this area³¹. Average annual temperature at 1000 feet is 54F, decreasing to about 41F at 3000 feet. Seawater temperatures off **the** West Coast are perhaps 10-15 F cooler than **the** Gulf of Mexico for comparable **depths** and seasons. Alaskan waters drop to the 28F freezing point in many areas during **the winter in water, with ice being even colder**. Ambient air temperatures in all areas can drop below seawater temperatures.

The hydrates can form wherever and whenever the gas is cooled below the solidification temperature in the presence of liquid water. The natural gas in the reservoir is hot (150-350F), far above the hydrate formation temperatures. However, the gas cools **as** it flows up the wellbore, through the equipment, and to shore. One problem area occurs at the choke valve. Most gases cool as the pressure is reduced from wellhead pressure to pipeline pressure. Another problem can develop if the gas flows through a subsea flowline from a remote well or platform to a central processing platform. The gas will be cooled by the seawater or mud on the sea bottom. When the gas is flowing, hydrates can form only if the seawater or mud temperature is below the hydrate point **and** if heat transfer is sufficient to actually cool the gas to the hydrate temperature. High flow rates and the corrosion and weight coatings on subsea flowlines sometimes restrict cooling sufficiently in short lines to prevent hydrate formation. However, when flow from a well or platform is stopped for **a** sufficient time for any reason, the gas will **cool** to the temperature of the surrounding water, mud or air. Hydrates can form, even **blocking** the flowline completely. Blockage can cause serious problems when the system is brought back into production.

Prevention of Hydrates. The formation of hydrates can be controlled mechanically or chemically. The choice depends on the system and on the **temperature and pressure conditions**. Thermal insulation can be used to minimize heat loss mechanically and keep the gas warm as long as possible. However, there will be times when flow is reduced or stopped for extended periods. If the surrounding temperature is below the hydrate point and liquid water is present, hydrates could form and cause problems. The situation is similar to protecting the cooling

water in a car. Parking the car in an unheated garage may provide satisfactory protection if the **outside** temperature only drops to 30 F overnight. If it stayed cold for several days, the water might freeze and rupture the radiator or engine. More reliable protection can be obtained chemically by adding "antifreeze" to the water.

The "antifreeze- added to the car works exactly **the** same way **that** hydrate inhibitors work. In fact, **the** ethylene glycol commonly used in car radiators is occasionally also used in gas systems. More antifreeze must be added to the radiator to protect against lower temperatures and more chemical must be added **to** the gas to get greater freeze point depressions of the hydrates. Methanol (methyl alcohol) is more commonly used in gas systems because it is normally much less expensive than the glycols.

Methanol. Methanol (CH₃OH) is used much more frequently than any other chemical when hydrate inhibition is required offshore. It is much less expensive per pound than the glycols but more pounds are required to obtain the same freeze point depression. A large fraction of the methanol will remain in the vapor phase, depending on the temperature and pressure of the gas in the system. **Moreover, substantial concentrations of methanol are still required in the water to obtain significant depression in the freeze point.** Figure 5 illustrates the approximate values of concentration of methanol in the water calculated from the Hammerschmidt equation³², a common guide. While **actual requirements may differ somewhat in practice, it is still quite apparent that substantial concentrations (10-50%) will be present in treated water separated from the gas.**

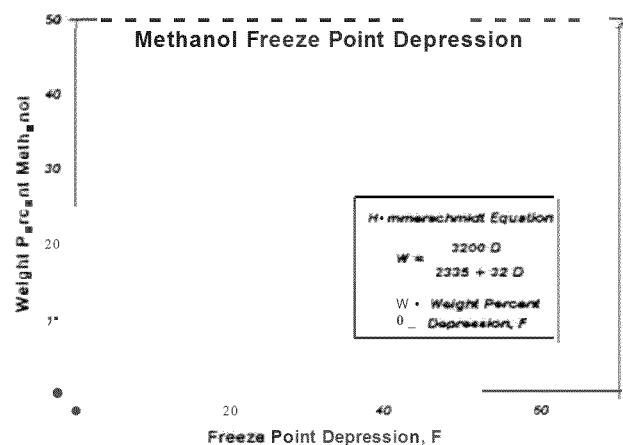


Figure 5. Approximate methanol concentrations in water required for freeze point depressions of natural gas/ freshwater hydrates.

Treatment is usually only economically feasible when little or no liquid water is produced from the reservoir. In **this** situation only **the** condensed water must be **treated** to prevent hydrate formation. Even so on **the** order of 5-15 gallons per MMSCF may be required to inhibit hydrates for moderate Gulf of Mexico conditions. One of the operators surveyed used an *average* of 9.5 gal. per MMSCF to treat the half of the gas requiring hydrate inhibition. Thus a remote 50 MMSCFD platform might require several hundred gallons per day methanol during cold weather conditions, **with** 50% or more remaining in **the** gas under many conditions.

Ethylene Glycol. In certain circumstances ethylene glycol ($\text{CH}_2\text{OHCH}_2\text{OH}$) may be the inhibitor of choice. It has a very low vapor pressure, essentially keeping all of the inhibitor in the water phase. If only small depressions are needed, elimination of **the** vapor losses may offset the higher price per pound.

DEHYDRATION CHEMICALS

Triethylene Glycol (TEG). As discussed earlier triethylene glycol, ($\text{CH}_2\text{OCH}_2\text{CH}_2\text{OCH}_2\text{CH}_2\text{OCH}_2\text{CH}_2\text{OH}$), is used almost exclusively for offshore gas dehydration. Since the dehydration system is normally a closed recirculation system, discharges are limited to abnormal occurrences. Typical **makeup** requirements are only about 0.05-0.3 gal per MMSCFJ3. This loss is almost totally spray or vapor carryover into the gas line to shore. One operator had a total makeup of 0.75 gal/MMSCF, with none of their systems requiring changeout during 1988. The higher than average losses probably reflect higher **than** average throughput fluxes to minimize space and weight requirements on **the** platforms.

Disposal of TEG is rare, as it usually does not become seriously contaminated. The greatest risk of contamination is carryover of liquids from the upstream separators. While hydrocarbon liquids are the most likely to be carried over, all but the very heaviest would be vaporized during the regeneration of **the** TEG. Very heavy liquids would collect on the surface of the accumulator, while solids would be removed by **filtration**. **Carryover** of corrosion inhibitors might cause a foaming problem, but antifoam chemicals can be added to minimize that problem. Carryover of salt water is unlikely, but does pose a serious problem if it occurs. The salt can only be removed by vaporizing the TEG in reclaimer units, which are normally not installed offshore. The TEG usually must be replaced if salt accumulation becomes severe. The TEG is normally drained into containers for reclamation or disposal onshore, but is sometimes dumped overboard with the water discharge.

Other Glycols. Diethylene glycol (DEG), $\text{O}(\text{CH}_2\text{CH}_2\text{OH})_2$, and tetraethylene glycol, $\text{O}(\text{CH}_2\text{CH}_2\text{OCH}_2\text{CH}_2\text{O})_3$, could be used for dehydration instead of TEG. The DEG would be used for processing cold gas to maintain a lower viscosity and better efficiency in the contactor. The tetraethylene glycol would normally only be used **with** unusually hot gases to minimize vaporization losses. One operator noted that some of their glycol systems contained a fraction of tetraethylene glycol in **the** TEG.

STIMULATION AND WORKOVER CHEMICALS

ACIDS

Hydrochloric Acid. Hydrochloric acid is the workhorse acid for oilfield stimulations, offshore and onshore. The concentration may vary for different situations, but 15% is the most common form. All **types** and concentrations will contain an acid corrosion inhibitor to minimize damage to the tubular goods and downhole hardware. The objective of the **acid is to dissolve calcium and magnesium carbonates** and/or iron corrosion products that are blocking flow paths. This acid is somewhat more expensive **than** sulfuric acid, but the latter can not be used. Calcium sulfate would precipitate, offsetting the dissolution of calcium carbonate, etc. Post-precipitation can be a problem even **with** hydrochloric acid, sometimes requiring special additives.

The acid will normally react rapidly because downhole temperatures are high. The acid will be largely neutralized within an hour or two, provided sufficient carbonate or corrosion product materials are present in the area contacted by the acid. However, paraffin or asphaltene coatings can prevent the acid from contacting the surface of these **materials**. **In these instances a detergent or solvent may be required to clean the surface to allow rapid reaction.**

Most acid jobs require several solutions being pumped down in series. A pre-flush solution, often 3-5% ammonium chloride, is used to push the hydrocarbon and formation water back away from the wellbore. If necessary, a detergent or solvent wash to clean surfaces is the next stage. The acid slug is then pumped in, followed by a post-flush solution. The post-flush solution pushes the acid further into the formation, allowing more efficient use of the acid. After the desired time, the "spent" acid and solutions are produced back to the surface, along **with the** dissolved materials.

The fluids produced from the formation after an acid job will consist of the "spent" acid, flush fluids, formation water, and hydrocarbon. These fluids must be processed before the oil can be shipped and

the waters discharged. It is not uncommon for these fluids to form a very stable emulsion, making it important to avoid upsetting treatment of the rest of the production. When the appropriate equipment is available, many operators will process fluids from this particular well through the test separator until production is again normal. In other instances the fluids are produced into a "bad oil" tank first, and then slowly blended with incoming production over an extended period. In almost all instances the spent acid and associated aqueous fluids from the job are blended with the produced water stream and discharged overboard. However, these fluids will be pumped into the pipeline with other production in those systems where all oil/water separation is performed onshore.

Operators normally do not perform detailed analyses or monitor to determine the amount of unreacted acid in the returns. In some instances the returns are checked and excessive acidity is neutralized. Most of the specialists interviewed believed that the acid was probably 95%+ reacted downhole, with further neutralization occurring when spent fluids were mixed with produced water. The carbonate/bicarbonate buffering system in seawater will ultimately neutralize any unreacted acid. In the absence of analytical data it would not be feasible to estimate the pH in the receiving water vs dilution volume.

Hydrofluoric Acid. Hydrofluoric acid is the second most common acid used in the oilfield. More specifically this acid is used as a mixture with hydrochloric acid and is commonly referred to as "mud acid". Concentrations may range as high as 12% hydrochloric acid and 3% hydrofluoric acid. Typical concentrations used in the Gulf of Mexico by the participating companies are 7.5% hydrochloric acid and 1.5% hydrofluoric acid. In addition some ammonium bifluoride may be added to increase the effectiveness. Mud acid is used because it can also dissolve sand and clays. The fine clays in drilling mud were added to prevent drilling fluids from flowing into the formation by forming a filter cake. However, some of the clay goes into the formation and can cause severe plugging. The mud acid is frequently used in the original well completion to remove these solids. However, it is also used later in the life of the well to remove fine sand or clay particles in the formation that may have migrated towards the wellbore and are blocking flow paths.

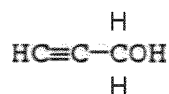
Mud acid treatments always involve a series of fluids, similar to that described above. Calcium fluoride is quite insoluble so it is necessary to prevent the mud acid from contacting a formation or formation water containing calcium. A typical sequence includes a 3-5% ammonium chloride preflush, followed by 5-15% hydrochloric acid. This

acid dissolves any solid calcium carbonate, etc. A second ammonium chloride flush pushes this acid and dissolved calcium further into the reservoir, separating it from the mud acid slug which follows. A final postflush solution of ammonium chloride or 3-5% hydrochloric acid pushes mud acid back for more efficient utilization of the fluoride. The spent acid and associated fluids are produced back in the same manner as described for hydrochloric acid.

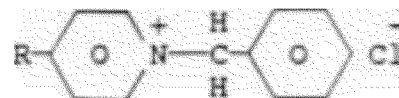
Other Acids. Acetic, formic and citric acid are sometimes used in acidizing. The citric acid may actually be added to any of the acid systems to act as a chelating agent to keep dissolved iron in solution. The first two acids are being used in wells completed with duplex alloy tubing for corrosion resistance. These alloys may be subject to chloride cracking failure at high chloride concentrations, especially under acid conditions at high temperature. Since both of these acids are weaker than hydrochloric acid, they will react slower with carbonates or corrosion products. Slower reaction rates may be an advantage at very high downhole temperatures to allow the acid to penetrate further back into the formation.

Additives. Additives other than corrosion inhibitor are only used when tests or experience indicates that specific problems are likely. Most have the potential of causing problems as well as preventing them. Obviously all will add to the cost of the acid job.

Corrosion inhibitors for acids will often consist of a mixture of types of compounds. Acetylenic alcohols, such as propargyl alcohol ($\text{HC}\equiv\text{C}-\text{CH}_2\text{OH}$) or alkyl substituted derivatives, are a common component. Alkyl pyridine quaternary ammonium compounds are also used. The strong acidity may limit solubility of some of these components, requiring a dispersant. Alkyl phenol ethoxylates or other surfactants may be used for this purpose.



Propargyl
Alcohol



Alkyl pyridine benzyl
ammonium chloride

Solvents can be used to dissolve paraffin or asphaltene deposits, allowing faster acid attack. Both aliphatic and aromatic hydrocarbon solvents are used, depending on the nature of the deposits. These solvents and deposits usually go into the pipeline with the oil, with virtually no carryover into the water discharge. Mutual solvents, such as oxyalkylated alcohols and ethylene glycol N-butyl ether, are also used on occasion. Some of these solvents will partition into the water phase.

Anti-sludging agents are primarily intended to prevent any hydrocarbon **solids** from being generated. Sludging is more likely to be encountered in heavier asphaltic crudes. [f some **solids** are formed, **these** agents are intended to keep them highly dispersed. Oil soluble long chain alkyl benzene sulfonates are one type of *compound* used for this purpose. These formulations can include hydrocarbon solvents, alcohols, and surfactants in proprietary formulations. It is likely that some components could **be** partitioned into **the** water. Paramn control is a similar problem, with ethylene vinyl acetate resins being used to prevent deposition.

Surfactants can **be** used for **these** same purposes but can lead to severe emulsification of the oil and treating fluids, potentially throwing both oil and water streams out of specification. Selection of the specific surfactant can minimize the problem, with fatty acid ethoxylates being one type of *compound*. [t is not uncommon to add a second demulsifier chemical to offset the emulsification. The demulsifier may be added **with** the acidizing fluids or into the returned fluids at **the** surface, depending on various **circumstances**. **The same types of compounds** are used as discussed for production treating chemicals.

Scale control agents are also used to prevent inorganic problems. Citric acid or ethylene diamine tetraacetic acid (EDTA) are used to prevent reprecipitation of iron compounds. Scale inhibitors **like those** used for produced fluids keep **the** calcium in solution. Clay stabilizers are used to stabilize clays, preventing swelling and permeability reduction. **Water solutions of potassium, ammonium or aluminum salts** are used. Longer term stabilization can be obtained with poly quaternary ammonium *compounds*. Dispersants are used to keep solids from aggregating and aid in their return. Fatty amido amines and propoxylated amines have been used for this purpose.

Acid diverters are used to improve the efficiency of the acid. Most of these are some form of an oil soluble resin. These finely dispersed solid particles are carried down with the acid, progressively blocking the more permeable streaks. This forces the acid into less permeable layers of the producing formation. Many of these resins are based on terpene. When the well returns to production, the oil dissolves the resin and restores the permeability. Recently foamed acid has been used. The foam reduces the hydrostatic head and may prevent fracturing of some reservoirs. The foam is more viscous, which helps divert some of the acid to less permeable streaks. Alkyl phenol ethoxylates and fatty alkyl quaternary ammonium salts are used as foaming agents.

DENSE BRINES AND ADDITIVES

Chloride Brines. Seawater has adequate density (8.5 pounds per gallon, ppg) to contain formation **pressure in many cases and is used wherever possible**. Seawater is also used extensively to flush residual mud or solids from the well. As greater density is required in workovers other brines are used. [n most instances the brines are brought to the platform as liquids. However solid **sodium** chloride and calcium chloride are often available for making minor adjustments to **the** concentration and density. Solid sodium chloride can be used for small density increases for seawater but mixtures with liquid **sodium** chloride solutions are more common.

Sodium chloride brines are available up to about 10 ppg and are the most widely used purchased brine. [n addition to use as completion and packer fluids, they also are used for special purposes. Solid **sodium** chloride particles can be added to saturated sodium brine to act as fluid loss control agents.³⁴ [n contrast to clay and barites used in drilling muds, the salt crystals will readily dissolve in produced water when **the** well is returned to production. Thickening agents (viscosifiers) can be added to improve the suspension of sand during gravel pack operations.

Calcium chloride brines provide densities up to about 11.5 ppg. Ideally these brines would only be required when densities between 10 and 11.5 ppg are required. Practically some operators use calcium chloride more extensively because of **the** uncertainty during planning as to whether 10 ppg will be adequate. One operator used calcium chloride as a standard for all wells if densities greater than seawater density is anticipated.

Potassium or ammonium chloride salts are used to minimize clay damage. Straight potassium chloride (to 9.7 ppg) may be required for especially **sensitive formations, but is more expensive than** sodium chloride. Often a few percent of either salt is added to other brines to obtain clay stabilization at a **more moderate cost**.

Bromide Brines. Calcium bromide is used for the next increment of density, up to 15.4 ppg. Because of its higher cost, these brines will often contain considerable calcium chloride. Less chloride salt can be included as the density requirement increases.

Zinc bromide is capable of the highest density, up to 19 ppg. However it is also the most expensive and can be corrosive.³⁵ Zinc is also classed as a hazardous substance by the EPA, requiring special handling. Fortunately only a very few wells require use of zinc bromide. Even then it is virtually always **used in mixtures with calcium bromide, sometimes**

calcium chloride too. The operating companies surveyed normally used brines containing zinc only as completion or workover fluids. This zinc brine is then displaced with a lower density brine to be left as a packer fluid and returned to shore for reconditioning. One operator indicated that only two wells had required zinc in the last several years, none in 1988. However, other operators do use packer fluids containing zinc.

Sodium bromide (to 12.4 ppg) and potassium bromide (to 10.8 ppg) are especially useful when the formation contains high concentrations of sulfate or bicarbonate ions. Potassium may be required if sensitive clays are present.

Brine Additives. The variety of additives used with workover fluids can be grouped according to their function.

Corrosion inhibitors are added by most operators. For the lighter sodium chloride brines, water soluble *compounds* similar to the production treating chemicals can be used. A sulfite oxygen scavenger is also commonly added. Biocides may also be added. The heavier calcium and zinc brines are more difficult because few of the above *compounds* are soluble in 30-60% calcium brines. Thiocyanate, thioglycolic acid and derivatives have been used. Since calcium sulfite has limited solubility one supplier has a substituted carbonylhydrazine for scavenging oxygen.

Fluid loss control with completion and packer fluids is a different problem than with drilling fluids. Any materials added to reduce fluid loss to the formation must be easily removed. Otherwise a major advantage of brines will be lost. The use of solid sodium chloride has already been mentioned. A fine dispersion of calcium carbonate powder is also used, but requires acid stimulation as the final step of the workover to obtain maximum well productivity. In both instances the object of the suspended solids is to deposit an impermeable **filter** cake on the surface of the formation. The **filter** cake prevents loss of expensive completion/packer fluid and avoids damage to the formation.

Viscosifiers are used to increase the ability of the brines to suspend solids. These suspended solids may be the fluid loss agents above or debris being circulated from the well. However, a major use is for suspending a graded gravel/sand mixture being pumped down in a gravel packing job. This mixture must be properly placed at the formation face to prevent fine sand and clay from being produced from the formation. If the gravel and sand become mixed during the pumpdown stage, the job has less chance of success. HEC (hydroxyethyl cellulose), gnar gum, and polysaccharide derivatives are used. Some synthetic polymers are required for higher **temperatures**.

ENVIRONMENTAL ASPECTS

GENERAL CONSIDERATIONS

Prediction of Environmental Impact. The prediction of the impact of discharge of any stream on the **receiving environment is an extremely complex** problem. The environmental section of this report will be directed towards properties of chemicals and aspects of their use in offshore operations which will be pertinent to determining environmental impact. This report will not discuss the impact itself nor conditions past the end of the discharge pipe, except for the following brief comments.

Any prediction of environmental impact must characterize the discharge stream and the receiving environment. Both requirements are particularly demanding for discharge of produced water from offshore platforms into the ocean. The produced waters, including the added treating chemicals, are highly variable. Formation water compositions are different and treating chemical requirements are not constant. The nature of the hydrocarbon and the relative water/hydrocarbon ratio also affect the fraction of the chemicals that will remain in the discharged water. Similarly, the relevant characteristics of the ocean are constantly changing. Winds, currents, salinity, dissolved oxygen, etc. are variable. The major study at the Buccaneer Field offshore Texas is an **example** of the effort required.³⁶

Laboratory Toxicity Testing. Laboratory testing of the effects of constant concentrations of chemicals **on specific organisms, either in static or flow** through tests, allows investigators to learn **much** about the relative effects of the chemicals and relative susceptibility of various species to the chemicals. Conditions must still be closely controlled to improve the statistical reliability of the results and allow meaningful comparisons between different test results. Direct extrapolation of results of static tests **to other organisms, chemicals, and environments** is often not feasible and can be misleading. Nevertheless, useful results can be obtained.³⁷

Acute aquatic toxicity tests are the most common laboratory evaluation. Test organisms of a chosen species are exposed to several different concentrations of the chemical. The number of surviving organisms is determined after prescribed intervals, e.g., 3, 12, 24, 48, 96, 168 hours. Results are analyzed statistically to determine the toxicity of the chemical to the organism. The most common reporting parameter is the LC50 for 96 hours, the maximum concentration at which half of the test organisms will survive for 96 hours. In general, **half will survive longer at concentrations lower than the 96 hour LC50**. Conversely, at higher concentrations half can only survive for shorter times.

Round robin testing³⁸ by three governmental, three commercial, and three industrial laboratories has shown **that** good reproducibility can be obtained for acute aquatic **toxicity** testing if a clearly defined protocol were strictly adhered to. A ratio of *only* 2.6 between maximum and **minimum** indicated LCSO values was obtained for **the** effluent for the species tested. The use of different protocols is probably a major cause of **the** variability in the aquatic toxicity data presented later in **this** report.

It is widely recognized that short term acute toxicity tests and observations can not totally assess **the** long term effects of particular contaminants or variations on **the** environment. Longer term factors include sub-lethal chronic effects on particular specimens or subsequent generations of the species. Longer term chronic toxicity testing involves observations on species exposed to the altered environment to detect changes, sometimes after several generations. Rigorous determination of chronic toxicity of a single pure chemical compound on single species is both time-consuming and expensive. Definition of the combined effects of the range of **commercial compounds and natural constituents** **on** **the** wide range of species in a highly complex and variable ecosystem such as **the** Gulf of Mexico would be a challenging and difficult task. It does not appear that such a massive effort is justified nor would it result in any significant improvement in the environment. Kimerle^{39,40} has studied many acute aquatic toxicity test results for various chemicals, species, and toxicological tests.

Solubility. Solubility of the various chemicals in **water and/ or oil is an important property in use** as well as in testing. In fact, definition of solubility and development of meaningful test procedures were matters of serious concern with the specialists interviewed in both supplier and operating companies. While test methods are beyond the scope of this paper, some aspects are pertinent to the interpretation and applicability of the data. Experienced **chemists can make reasonable semi-quantitative** predictions of the solubility or distribution of pure compounds between an aqueous and liquid hydrocarbon phases. However, behavior of impure mixtures is very complicated. Most commercial formulations are complex mixtures of solvents and homologues of one or more *compounds*. For example, what is **the** effective solubility (or distribution coefficient) of such a formulation if the 15% isopropyl alcohol primarily goes into the water phase and the 35% imidazoline corrosion inhibitor plus 50% naphtha solvent primarily goes into the oil? Distribution between phases of the components in a formulation will probably be a function of dosage. It certainly will be affected by the compositions and ratios of the oil and water phases.

The effects of **these** kinds of **factors** on testing of biodegradability of insoluble chemicals have been called into question by Boething.⁴¹ He suggested **that** variability in procedures for adding and dispersing insoluble chemicals can significantly affect test results. While Boething was primarily addressing biodegradability, it would appear that his concerns would also be applicable to aquatic toxicity testing.

Chemical characterization. Characterization of **the** specific chemical compounds and/or functional groups responsible for toxicity is highly desirable. Identification might *allow* objectionable components to be eliminated from a formulation **without** sacrificing the functional objective. In addition, more complete chemical characterization and pertinent analytical methods would be very useful in refining cause/effect observations in site studies.

Biodegradability. The tendency of a chemical to **accumulate in the environment is its persistency**. Conversely, destruction of the chemical by biological mechanisms is called biodegradation, which can be roughly measured by biochemical oxygen demand tests (BODs). Data presented by Robichaux for biocides (see Table 5) indicated that all were degraded to near 100% of theoretical within five days, with the exception of the chlorinated phenols. The latter are no longer used because of this poor biodegradability. BODs data were available for many of the specific formulations in Table 6 for company B. Many of **the** formulations were nearly 100% degraded within five days, with most of **the** remainder being consumed **within** 20 days. Three emulsion breakers exhibited the poorest biodegradability, perhaps reflecting Boething's⁴¹ concern about testing of insoluble chemicals. However, it is important to remember that these oil soluble materials go to the oil pipeline rather than being discharged to the ocean.

AQUATIC TOXICITY DATA

Production Treating Chemicals. An integral part of the discussions with the supply companies was concerned with aquatic **toxicity** data for the various kinds of chemicals described earlier. In general, only limited amounts of such data were available. The toxicity data summarized in **the** following tables were obtained on a wide variety of species, accounting for much of the variability in the data for any particular formulation. In addition, the testing protocols may not have been identical. Because of these factors, care must be taken in making direct comparisons between specific test results. These data are, however, useful in showing order of magnitude aquatic toxicity of the various treating chemicals. *All* concentrations in the data obtained from

Table 3. Acute Aquatic Toxicity Data (LeSO) of Biocides '1,2)

Generic Type Company	Generic Chemical Type	Fresh Water				Salt Water			
		Sheepshead minnow	Bluegill	Trout		Oysters	Salmon		
Aldehydes	Glutaraldehyde (25%)		37.6	42.1	16.9#	2.1#	41	85	
	Glutaraldehyde (50%)		24.42	24.33	"j		11001)	85	1451,75}
	Formaldehyde	41.9K 42K	37.64q	64n,23p	180		330b,1000b		100-330..
Formaldehyde/ mixture	0 Formaldehyde+heterocyclic polyamine		41.4	73.3		2.9	358		>1000
	0 Formaldehyde+alkyldimethyl benzyl quat		1.79	2.24		0.47	12		290
	0		1.51	1.41		0.30	7.6		
Quaternary	Ethoxy quaternary		0.16	1.32		36	174C		1000
	01 cocoamine	0.55,0.42k	0.1	0==			34b	0.40	1.21;0.55e
			0.5				40		"j
Amine Salt	0 Cocodiamine acetate		0 ==	1.6	0.11		4.2C	99.6	1.11;0.49e
	C	0.448	0.622			0.711	2.39a		
			0.65	0.68	0.48#	==,	1],1'C	79	
	0 Cocodiamine fatty acids		0.73	0.92		0.22	12		670
	1 alkyl (C6-C18) amino-3 aminopropane acetate		0.65	0.34		.64	31 7C		111
	1 (alkyl amino)-3 aminopropane acetate		0.71	0.91	0.26#	922	24		.0
	Coco propane diamine hydroxy acetate+		1.15	1.61					
	Triclorophenol								
	N-Coco-1,3 propane diamine benzoate	1.0			0.09				
	0 Alkyl propylene diamine+2 ethylhexanol		0.71	0.75					49
Other	metronidazole		>1000	>100			180d		
	1,1-01 bromo-3-nitripropionamide	8.15f	==y		4.5#	2.8-5#	9d,57.5C	70	>1000q,100h#
	C Oithiocarbamates	1.29					1.38b		
	C Isothiazalin	40.6				66.1	217a		
	D						111		4000
	J 2,4,5-Triclorophenate		1.26	0.86					
References	Bis tri-n-butyltin oxide.		0.046	0.046					
NOT USED IF PRODUCTION OPERATIONS	alkyl dimethyl benzyl quaternary								
	Toxaphene pesticide		0.042	0.036					
NOTES:									
(1) Concentration (ppm, as sold) 101 50% luvival for 96 hours; except # are for 48 hrs. direct data comparisons may not be valid because 01 different species; strains; and/or test lratocols.		a - white Shrimp	V - Asiatic Clams		* - Flounder				
		b - Ifown Shrimp	h - Brackish water Clams		n - Atlantic Salmon				
		C - Grass snrh,o	I - Plaice		o - Channel Catfish				
		d - Mysid Shrimp	J - Stickleback		p - Armed Bullhead				
		e - Sheepshead minnow	k - Fathead Minnows		q - Green Sunfish				
		I - Large Mouth Bass Fingerlings							
(2) All data are unpublished and were furnished 01 the participating chemical supply companies.									

vendors in this report are presented on an "as sold" basis (Tables 3, 6, 7). The concentration basis in Tables 4 and 5 is not known for certain. Because considerable attention has previously been focused on the biocides, they will be discussed separately.

Biocides. Information obtained directly from the suppliers in this survey is shown in Table 3. The widely used aldehyde class of compounds exhibited relatively high LC50 concentrations compared to the other biocides. Mixtures of other types of biocides with formaldehyde are common and appear to reduce the LC50 values to the same range as the added biocide. It should be noted that many of the

salt water toxicity tests were run on shrimp, crabs, and oysters only. In a few cases where data also included fish species, the fish appeared to be less tolerant of the biocides. The quaternary ammonium and amine salts are significantly more toxic to fresh water species than the aldehydes or the other biocides used in production operations. As a comparison, two materials not used in production operations are also listed. The toxaphene pesticide is included as a reference test material by some laboratories as a control reference pollutant. The tributyltin/quaternary is sometimes used in closed loop cooling systems.

Table 4 is taken from Zimmerman and deNagy,⁵ summarizing acute toxicity and four chronic toxicity data for several biocides used in oilfield applications (production and/or drilling). Note that their concentrations are in ppb (parts per billion), not ppm (parts per million) or ppb (pounds per barrel, a common drilling fluid unit). Other data in their paper plus information from companies interviewed in this survey indicate that the various forms of thiocarbamates and bis (tributyltin) oxide are not widely used in production operations. Glutaraldehyde, formaldehyde (and paraformaldehyde), various quaternary ammonium salts, amine salts, and mixtures of these are far more common. Acrolein has been used in some applications but its use is apparently decreasing. It is significant to note that these "production" biocides generally have higher aquatic toxicity LC50 values than the thiocarbamates which apparently are more common in drilling operations.

In 1975 Robichaux⁴² reported the aquatic toxicity of some biocides used in drilling and completions (Table 5). Some of these generic chemical types are similar or identical to those used in production operations.

Generic Chemical Type	LC50 * Salt Water
Aldehydes	50-400
Chlorinated Phenols**	0.2-1
Quaternaries	0.2-5
Amines	0.4-4
<p>▪ Concentration (ppm, as sold) for 50% survival for 96 hours. Data on fish, shrimp, crab and oyster species. Direct data comparisons may not be valid because of different species and/or test protocols.</p> <p>** Not used in offshore production operations in U.S. since early 1970s. CMH</p>	
Table 5. Aquatic Toxicity Data for Several Classes of Biocides	

Direct and detailed comparison of acute toxicity data between various sources and investigators can be virtually meaningless unless species, temperature, procedures, etc. are similar and well defined. Even with this reservation, the range of acute toxicity for the "production treating chemicals" in Table 4 is about 0.2-2 ppm. This range is about the same as the 0.2-1.6 range for fresh water found in this survey (Table 3) and reported by Robichaux (Table 5). The 2,2-dibromo-3-nitropropionamide (4-8 ppm) and formaldehyde (10-50 ppm) LC50 values are significantly higher. Much of the salt water acute toxicities were only determined on shrimp, crab and oysters. The LC50 values in the fish tests obtained

in this survey were neither consistently higher nor lower than those species. The larval brown shrimp were one of the most sensitive of the species tested in the Buccaneer Field study, which also included fish.

Other Production Treating Chemicals. The available data on other types of production treating chemicals from the suppliers interviewed are summarized in Table 6. While essentially all of this data was accumulated on specific formulations, many of the formulations contained only a single type of compound as an active ingredient. However, solvents and minor additives in the formulations can result in substantially different solubility characteristics and correspondingly large effects on aquatic toxicity. Hence, this data is insufficient to draw firm conclusions on absolute toxicity of the various types of generic compounds discussed earlier. There are some gross differences and trends, however.

First, LC50 (96 hour) values for most of the production treating chemical formulations in Table 6 are substantially higher than those values for biocides in Tables 3, 4 and 5. While the same reservations on comparisons of aquatic toxicity data are still applicable, some of the corrosion inhibitors and the water soluble polyamine quaternary ammonium coagulant are clearly in the same fresh or salt water toxicity range as the quaternary ammonium and amine biocides. Second, all of the other production treating chemicals are about one to three orders of magnitude less toxic.

Third, available data is insufficient to represent all compounds and combinations of compounds in the multitude of formulations used for various purposes in offshore production operations.

Gas Processing Chemicals. Aquatic toxicity data for the chemical compounds used in hydrate control and dehydration obtained from the literature and from one supplier are given in Table 7. It is readily apparent that these chemicals are relatively non-toxic, with LC50 values of 10,000 ppm (1%) or more being common. In fact, these compounds are often used in aquatic toxicity testing to aid in dissolving materials with limited water solubility.⁴³ It is very unlikely that discharge concentrations of this order of magnitude would ever be encountered in offshore operations. Methanol added to any one well during a startup would be diluted by produced water from other wells prior to discharge. However, one area of particular concern to the operating companies is the potential use of methanol for hydrate control in deep or northern waters where the water is always cold. Continuous methanol addition could be necessary, especially if the subsea flowlines were long.

Table 4. Aquatic Toxicities and Recommended Application Concentrations for Chemicals in the Host Widely Distributed Biocides in Calendar Year 1981 *

CHEMICAL NAME	LOWEST REPORTED ACUTE TOXICITIES (ppb) **	LOWEST REPORTED CHRONIC TOXICITIES (ppb) **	RECOMMENDED APPLICATION CONCENTRATIONS
Paraformaldehyde	2,000 fl		0.5 to 1.0 lb. per barrel (595-1200 ppm) continuous 0.1 to 0.25 lbs/barrel (120-300 ppm)
Acrolein ²	55 ml 68 ff	100 ml 21 ff	Initial dosage - 10 ppm. Continuous treatment - 1-15 ppm
Glycolic Acid	No data available	No data available	
Glutaraldehyde ¹	2,100 ml		Slug treatment - 500 ppm, continuous treatment - 30 ppm
Oxydiethylene bis (alkyl dimethyl ammonium chloride)	No data available	No data available	Slug treatment - 500 ppm, Continuous treatment - 30 ppm
I (alkyl amino) J amino roane acetate	340 ff 120 fl		
3-alkoxy-2-hydroxypropyl trimethyl ammonium chloride	350 ml 960 ff		Waterflood & salt water disposal systems - 50-100 ppm continuous at first. Follow-up with 10-15 ppm continuous to maintain control. May also be fed intermittently at a rate of 50-200 ppm for 4-8 hrs. a day, one to four times a week.
	127 ml	43 ml	1 pint to 1 quart per 1000 barrels (3-6 ppm).
Sodium dimethyl dithiocarbamate	127 ml		1 pint to 1 quart per 1000 barrels (-6 ppm).
1 (allyl amino) 3-aminopropane	No data available	No data available	
Potassium N-methyldithiocarbamate	180 ff 182 fl		Slug treatment 1.5 to 3 fl. oz. per 1,000 gal. (11.7-23 ppm). Subsequent treatment 0.5 to 3.0 fl. oz. per 1,000 gal. (4.0 - 23 ppm) should be made every 1 to 5 days.
01 sodium cyanothioimido-carbonate	180 ff 182 fl		Slug treatment 1.5 to 3 fl. oz. per 1,000 gal. (11.7-23 ppm). Subsequent treatment 0.5 to 3.0 fl. oz. per 1,000 gal. (4.0 - 23 ppm) should be made every 1 to 5 days.
2-(thiocyanomethylthio) Denzothazole	29 ff		for secondary recovery: 0.1 to 0.2 fl. oz. per 1,000 gal. (2-30 ppm). For drilling mud: 0.1 to 0.25 fl. oz. per 1,000 gal. (2-30 ppm).
1-(alkylamino) 3-amino propane adipate	100 ff 280-160 ml		for secondary recovery: initial treatment use 6.3 to 25.4 fl. oz. per 1,000 gal. (23-94 ppm a.i.). Subsequent treatment: use 1.3 to 1.2 fl. oz. per 1,000 gal. 5-12 ppm a.i.
Potassium dimethyldithiocarbamate		3.8 ml	for secondary recovery: 0.83 to 1.66 fl. oz. per 100 barrels (6-12 ppm); For drilling mud: 0.6 to 1.0 fl. oz. per 100 barrels (143-714 ppm).
2:2-dibromo-J-nitropropionamide			Continuous feed initial treatment: Use 1 to 2.2 fl. oz. of product per 1,000 gal. of water (2-16 ppm a.i.). Subsequently, use 0.1 to 1.5 fl. oz. of product per 1,000 gal. (0.1 - 1.5 ppm a.i.). For intermittent treatment: 2-16 ppm a.i. For slug treatment 40 ppm a.i.
Acetic acid	No data available	No data available	
Alkyldiamine-mono benzoate	No data available	No data available	
81s (tributyltin) chloride	0.96 mf		

* Entire table is from Reference 5. Zimmerman, E. and Denagy, S. "Biocides in Use on Offshore Oil and Gas Platforms and Rigs". EPA Draft paper, April 11, 1984.
ppb is parts per billion; presumably by weight. CMH

Toxicity data for: fl - Freshwater Invertebrate ml - Marine Invertebrate
ff - Freshwater Fish mf - Marine Fish

Documented impacts to fish and divers from the discharge of this chemical during the Buccaneer Field study.

Chemical in use on offshore platforms based on 30 platform study in the Gulf of Mexico.

Chemical approval for use on production platform in Alaska requested from Reg. X by manufacturer.

Chemical in use on drilling rigs and platforms based on 74 well survey in Gulf of Mexico.

Table 6. Acute Aquatic Toxicity Data (ICSO) of Other Production Treating Chemicals '1.2)

Purpose	Company	Generic Chemical Type	Fresh water				Salt water		
			Sheepshead minnows	Bluegill	Rainbow Trout	Daphnia	Oysters	Shrimp	Stickleback Others
Scale Inhibitor	A	Ammonium phosphate ester	>4309	>1000	>1000		>4309	>4309a	
	C			700				5350b	
	J	Phosphate						5350b	
	C		>10125				>10125	>10125	
	J		6027					2920c	
	J					1200		1676e	5600k
	J								1200
	O								
Corrosion Inhibitor		Ammonium phosphate	75h					50b	500f
			7.37				52.6	5.18a	
			8.74			52	26	2.42a	
								50.0b, 617c	
								3.03b	
								23.9b	
								2.12b	
		(2)				0.26			
	J	Quaternary		1.3				1050b	
	C	Quaternary (water soluble)		1.50	2.80				
	J	Alkyl aryl ammonium salt+cyclic amine						5.96b	
	J	Alkyl aryl ammonium salt+alkyl amine						116b	
	C	Amine salt (water soluble)	0.86				.89	2.65a	
	J	Alkyl amine salts						710b	
	J	Alkyl amines + alkyl acids						1.98b	
	J	Cyclic amine + poly ether						3.69b	
	J	Cyclic amine, vinyl cooly_r						3.15b	
	C	sulfonate						220b	
	J	Phenanthradine	6.1h						
	●	Aromatic heterocycle	6.1h						
	●	Pyridine salt + quaternary	2.16, 2.26n						
	J	Alkyl morpholines						800, 10550	
	●	Quaternary+organosulfur+phos. ester	12h						
Reverse Breaker	●	Ammonium bisulfite		110					100-420
	C		11				77	788a	
	O	Sodium sulfite			7000				
	J	Cationic polyelectrolyte+metal salts		4.00		1.2			56
	C	Polyamine ester + zinc salt							10101
Coagulant	C	Polyacrylate	16713				15621		
	●	Cationic polyelectrolyte		1.1		1.2			56
Surfactant	●	Polyamine ester					>1000c		>1000k
	C	Polyacrylamide					14800b		
		Phosphate ester					1800b		
	●	Polyamine quaternary		0.52					
	C	Polyquaternary					21.01		
	O	High alcohol modified fatty acid			50				
	D	Tributyl phosphate							
		Oxalklate							5.6g
	C		19				10		
	C		111				78.1		
H ₂ S scavenger	C	Alkylated phenol	111				89.1		
	J		75.0h	18.0		10			56.8
	J	Cationic (quaternary)							41
	J	Glycol ether						40.0b	
	O		183						
Atmos carr inh	C	Chelated zinc	245				235		
	C	Over-based calcium sulfonate	2290				>2635		

NOTES:

(1) Concentration (ppm, as sold) for 50% survival for 96 hours. Direct data comparisons may not be valid because of different species, strains, and/or test protocols.

(2) low molecular weight.

(3) All data is unpublished and was furnished by the participating chemical supply companies.

- White Shrimp

- Brown Shrimp

- Grass Shrimp

- Pin. Shr 10'0

e - Mummichog

Stickleback

Hull Minnows

Fathead Minnows

Plaice

Fiddler Crab

- Mysid Shrimp

CONTINUED

Table 6. Acute Aquatic Toxicity Data (LC50) of Other Production Treating Chemical' (1.2)									
- - - CONTINUED - - -									
Purpose	Company	Generic Chemical Type	Fresh Water				Salt Water		
			Sheepshead Minnows	Bluegill	Rainbow Trout	Daphnia	Oysters	Stir Imp	Stickieback Others
Emulsion Breaker	●	Oxyalkylated dipropylene glycol			40f				
	●	Oxyalkylated phenol formaldehyde resin		24		80		3.8c	28.19-4j
	C	"	5.26					5.24b	
	C	"						5.4c	6.7c
	●	"							40.0
	●	"		24.0				3.8c	28.0
	J	"						3.56b	
	J	Phenol formaldehyde resin + polyethers			16.0				
	J	Phenol formaldehyde resin			25.4				
	●	Alkyl aryl sulfonate		1					10
Paint Inhibitor	●	Not provided		17		25-44		17.1c	32.37.4j
	●	Not provided	39.9h			32.2			
	●	Vinyl polymer	42.0					2.7k	
	●	Sulfonate salt		11.0		25.1			37.4j
	J	Alkyl polyether + aryl polyether						1.55b	
NOTES: (1) Concentration (ppm, as sold) 10' 50% survival 10' 96 hours. Of test data comparisons may not be valid because of different species, strains, and/or test protocols. (2) Low molecular weight. (4) All data unpublished and was furnished by the participating chemical supply companies.									
						a - White Shrimp ● - Brown Shrimp c - Grass Shrimp d - Pink Shrimp e - Mysid Shrimp			
						f - Stickieback ● - Bull Minnows h - Fathead Minnows i - Plaice j - Fiddler Crab k - Mummichog			

Table 7. Acute Aquatic Toxicity Data (LeSO) of Gas Treating Chemicals *										
Chemical Name	Purpose	Re	Chemical Concentration mg/liter							
			Fresh Water				Salt Water			
			Sheepshead Minnows	Bluegill	Rainbow Trout	Daphnia	Others	Oysters	Shrimp	Others
ethanol	Hydrate Inhibitor	44	4000a.0.1	17000a.100.1	8000.2	>10000.2			10000m.1	
		45							120000	200000
		47	>100.1	>100d		>100				>20000g
Ethylene Glycol	Hydrate Inhibitor	44	5000f.1							
		48				50000.1	10-200000			
		49	>10000			>10000.2			>20000.2	
		H	>10000e			>10000.2	>10000g			
		H					49300h			
Diethylene Glycol	Hydrate Inhibitor			>5000.1	>32000c.1					
Triethylene Glycol	Dehydration	44	>5000f.1							
		43							>1000n.23	>1000r.28
		H	>10000e			>10000.2	62600n.7			
Data are from the literature, references at the end of the report, except for that contributed by participating chemical supplier H.										
NOTES:										
TOXICITY data are LC50, 96 hr EXCEPT										
1	1 day, 24 hr test		conc '0'	0% fatalities						
1	1 day, 48 hr test		100 Conc '0'	100% fatalities						
1	1 day test									
23	23 day test									
28	28 day test									
EXAMPLE: 50001.100.2 1, 2 day test **in goldfish. 5000 ppm caused 100% fatalities.										
SPECIES are Identified by letters										
FRESH BRINE										
a	Creek chub									Brine Shrimp
b	Ceriodaphnia d/a									Mysid shrimp
c	Mosquito fish									Copepod
d	5 other species									Bleak
	Fathead minnows									J gastropods
	Goldfish									Silversides
	Sewage bacteria									

Stimulation and Workover Fluids. Essentially no data were obtained on the aquatic toxicity of any of the stimulation or workover fluid chemicals. The various companies contacted indicated that neither they nor their suppliers had run any such tests. No useful data was found during the literature search. A limited amount of pertinent data were included in a recent summary of toxicity of drilling fluid additives⁵⁰. These data were taken using the protocol specifically designed for drilling muds (40 CFR 435, 26 Aug. 1985) and the concentration basis and results are not comparable to data presented in this report. Those materials likely to be used in completion or packer fluids appeared generally to have LC50 values well above the 30,000 ppm limit applicable to drilling muds and that protocol, indicating they are environmentally acceptable.

PRACTICAL ASPECTS

System Effects. The fraction and concentration of various chemicals in the effluent water depend on several factors. For example the point where a production treating chemical is added is important. Corrosion inhibitors added to gas pipelines are carried to shore and removed at the processing plant, usually being sent to disposal wells. Scale inhibitors added to offshore water treating equipment will primarily be discharged with the water. The solubility characteristics of various formulations (while usually not precisely definable) are generally such that almost all of the formulation is expected to go either to the oil or to the water phase. Notable exceptions are low molecular weight alcohols and glycols added to oil soluble formulations (to provide low temperature protection and drum stability) which will normally partition into water.

Specifications on the water discharges and on oil sales pipelines affect the overall disposition of chemicals. Surface discharges of water are restricted to a monthly average of 48 mg/l total "oil and grease", of which only a tiny fraction (e.g., 20-100 ppm in that oil) would be oil soluble treating chemicals. On the other hand, oil sales specifications usually allow 0.25-1.0% (2,500-10,000 ppm) water in the oil. Thus, more of a water soluble treating chemical can be carried with the oil. Furthermore, a significant (albeit unknown) fraction of the water soluble chemicals with surfactant properties will tend to collect at the oil/water interface in separators and in the skimmings or froth in the water treating equipment, usually being carried along as a part of the allowable water in the sales oil. The effective concentration of water soluble treating chemicals in this water is thus likely to be substantially greater than in the bulk water phase being discharged. Thus, less water soluble chemicals will be discharged than might otherwise be expected.

Production Treating Chemicals. The environmental aspects of the various types of production treating chemicals will be briefly summarized in the same order as presented earlier.

The required scale inhibitor concentration of 3-10 ppm is far below the LCSO values of 1000 ppm or greater. Although none of the operators contacted used squeeze treatments offshore, such treatments potentially could lead to initial high discharge concentration immediately after a treatment. The peak return concentration from a well conceptually could be the same as the injected concentration (2-10%). More likely it will be diluted by at least five to ten times by the flush water and by produced water from other layers within the same well. Thus, a peak slug concentration from a well would probably not exceed 1% (10,000 ppm) from the well, dropping rapidly to a few hundred ppm within a few days, depending on the producing rate. All of the wells producing into a single production separation system will not be squeeze treated at the same time. Hence, the combined discharge water stream will have a substantially lower concentration of scale inhibitor than from any individual well. Even a 10:1 dilution by other wells drops the peak concentration to the same level as the LC50 values. Continuing developments in squeeze technology, e.g., precipitation squeezes,²¹ allow longer treatment life with better **chemical** utilization (lower peak slug concentrations). It is apparent that discharge concentrations of scale inhibitors are below LC50 ranges.

Corrosion inhibitors exhibit a wide range of aquatic toxicity. The most commonly used inhibitors are predominantly oil soluble, with many having LC50 values of 20-500 ppm. This is equal to or greater than the normal continuous dosage of 10-20 ppm. However, others have LC50 values below 10 ppm and have greater potential adverse effect when discharged. Peak concentrations of 1000 ppm from batch-type treatments may be seen from individual wells but would be diluted by other wells. Furthermore, a large percentage of the inhibitor *compound* probably goes into the oil phase and is not discharged with the water. The lower molecular weight formulation in Table 6 is classed as oil soluble, water insoluble, and is primarily recommended for **continuous addition into gas wells. Hence, its treatment** concentration will be relatively low (e.g., 20-50 ppm maximum) and essentially all would go with the hydrocarbon condensate or produced oil. The phenanthradine formulation contains a surfactant to allow the concentrated inhibitor to be dispersed in water for treatment but only be oil soluble after application in the system (continuous injection in gas wells). The water soluble inhibitors are significantly more toxic, probably because they are of the same generic type as some of the biocides. However, these inhibitors are not applied as squeeze or slug

slug treatments. The ammonium bisulfite toxicity is probably totally due to the scavenging of all dissolved oxygen and would be completely negated by a 1:1 dilution with aerated seawater at discharge. With the exception of the water soluble inhibitors, the combination of high oil solubility and low probable concentration indicates that most corrosion inhibitors will be near or below their LCSO values.

The biocides are the most toxic of the various types of production treating chemicals. The application concentrations for the commonly used formaldehyde and glutaraldehyde formulations are generally in the same range as the LC50 values in Tables 3 and 5 (10-400 ppm), although Zimmerman's values (Table 4) are significantly lower (2 ppm). Acrolein is more toxic but is also more reactive and can be neutralized with bisulfite prior to discharge. The chlorinated phenols (Tables 4, 5) are no longer used in U.S. offshore operations. Quaternary ammonium and amine salts have lower LC50 values than the aldehydes but can become deactivated by adsorption onto surfaces of suspended solids particles.⁶ The remaining biocides (thiocarbamates, etc.) also had low LC50 values (Table 4) but constituted only about a sixth of the products in use in the Thirty Platform survey.⁶ Because of high water solubility, relatively high concentrations during batch treatments, and probable treatment of the full discharge stream, it appears likely that discharge concentrations will equal or exceed typical LC50 values in many instances, although some of the biocides can be deactivated by solids or specific treatments.

Emulsion breaker toxicity data were provided by Company B for three formulations with a single generic compound. An alkyl aryl sulfonate showed an LC50 7-10 ppm for the species tested. The oxyalkylated phenol formaldehyde resin formulations showed 4-80 ppm, while the oxyalkylated dipropylene glycol had a 40 ppm LC50 for a fresh water species. Formulations from the other suppliers were in the same order of magnitude, even when mixtures of compounds were present. With a normal maximum treatment rate of about 50 ppm (based on oil) and at least 90% going with the oil, only 5 ppm or less of the total formulation would be carried over into the water. This concentration is at or below the LCSO for most of the available data.

Reverse breakers, coagulants, and flocculants are similar in chemical composition and application. The limited toxicity data indicates that LC50 values are relatively high in comparison to use concentrations (1-10 mg/l) except for the polyamine quaternary ammonium formulation. Ironically, that specific formulation is also approved for use in municipal water treating plants! All three types of chemicals are expected to aggregate on the surfaces of oil droplets or solid particles in flotation cells and will

tend to be carried with the oil skimmings or froth and be recycled to the oil streams. The concentration of chemical in the effluent water will be substantially reduced. In fact, if more oil or solids were redispersed in the same water, another dose of chemical would be required to achieve separation again. The concentration of chemical is apparently too low to be effective. Aluminum and iron salts are the more commonly used inorganic agents with LCSO values (for the ions) of 10 and 21 ppm respectively for crustaceans^{4(p231)}. Zinc salts are also used, with LC50 values of 0.1-60 ppm for a number of species^{4(p234)}. Based on the relatively high LC50 values and the strong adherence to particles and oil droplets, discharge concentrations for most will be near or below their LCSO values.

Antifoam aquatic toxicity data were available for two materials. The normal treating concentrations 0.2-2 ppm in water, 5-20 ppm in oil) are lower than the LC50 concentrations for both of these formulations. Toxicity data were not available on the two classes discussed earlier. It was pointed out, however, that both the silicone and polyglycol ester generic compounds do have applications in the food processing industries.

Surfactants used in offshore cleanup operations are usually very similar chemically to those used in household detergents and other industrial cleaning formulations. The indicated LC50 values are mostly above 50 ppm (Table 6) for the two primary generic types. Since these materials are primarily used for required housekeeping and maintenance purposes, it is difficult to suggest a discharge concentration. However, such uses are certainly not a continuous or every day activity.

Paramn treating chemicals, both inhibitors and solvents, would be expected to go with the oil. It is unlikely that significant quantities would be carried with the emuent water.

Treatment/Toxicity Summary. Treatment dosages, system dilution ratios, and LC50 values of the various functional types of production treating chemicals have been presented. The variation of each of these factors has been discussed. Table 8 has been prepared to tabulate these variables, recognizing fully that it is a simplistic, general summary. The "discharge conc: is an estimated concentration range in the discharge pipe. The top group are all water soluble and expected to be primarily in the water phase. The biocides are the only type where the discharge concentration is likely to be above the LC50 values, and then only for periodic short durations. The corrosion inhibitors are the most complex type, as compounds and formulations are made to be water soluble, oil soluble, or mixed solubility / dispersibility. The water soluble compounds are most likely to resemble the biocides chemically. These inhibitors are most likely

to be added to injection water or gas pipelines and not be discharged to the ocean continuously. The oil soluble corrosion inhibitors will be at or below the LC50 value, except possibly for short periods after

Function Type	Use Cone. ppm	Discharge Cone. ppm	LC50 ppm
Scale Inhib	3-10 Normal 5000 Squeeze	3-10 50-500	1200->12000 90% > 3000
Biocides	10-50 Normal 100-200 Slug	10-50 100-200	0.2->1000 90% > 5
Reverse Breakers	1-25 Normal	0.5- 12	0.2- 15000 90% > 5
Surfactant Cleaners	??	??	0.5-429 90% > 5
Carras; on Inhib (1)	10-20 Water 10-20 Oil 5000 Squeeze	5- 15 2- 5 25- 100	0.2-5, 90%>1 2-1000, 90% > 5
Emulsion Breakers	SO oil	0.4-4	4-40, 90% >5
Paraffin Inhib	50-300	0.5-3	1.5-44 90% > 3
(1) "Water" indicates a water soluble inhibitor, not usually squeezed or slug. "Oil" is mostly oil soluble. "Squeeze" is maximum concentration in returns after squeeze or batch.			
Table 8. <u>Rough</u> Comparison of Usage, Discharge, and LeSO (96 hour) Values.			

squeeze or batch treatments. The predominantly oil soluble emulsion breakers and paraffin inhibitors will be at or below the LC50 values, except possibly for short periods after squeeze or batch treatments. The predominantly oil soluble emulsion breakers and paraffin inhibitors will be at or below their LC50 values in the discharged water.

Overall Consumption Estimate. Unfortunately, data are not available on the total quantity of these various treating chemicals used in offshore operations. Most of the operating companies apparently do not summarize or report the amount of these chemicals used in their operations. The chemical supply companies are not always sure where their chemicals are actually being used. Hence, only rough estimates can be made for total chemical usage.

Two of the participating operating companies determined usage of production treating chemicals in their operations during 1988. As pointed out earlier, distribution of the chemicals between oil and water streams is an educated guess by the operating and chemical company specialists and the author. These data are summarized in Table 9.

While the absolute and relative consumption of the various types of treating chemicals will certainly

vary between operating companies, the major uses are probably indicated with reasonable accuracy. Of the total estimated 1988 usage, only about 40% (138,070 gal.) are expected to be water soluble, with perhaps about a third actually going to the water phase. Only about 7,828 gal. of the estimated usage of 3,077,791 gal. are biocides, the chemical with greatest potential risk to the environment.

A substantial fraction of the material going to the water will be consumed in performing the specific function, i.e., corrosion inhibitors adsorbing onto steel surfaces, scavenger reacting with oxygen, biocide reacting with bacterial cells, etc. Thus, the overall fraction of treating chemical actually ending up in the discharged water will be about 25% or less, although the exact fraction is not known.

A total estimated 1988 chemical usage-for the Gulf of Mexico is also shown in Table 9. The operations covered by this specific data produced 8% of the gas, 11% of the oil and 17% of the water from 7% of the wells in the Gulf of Mexico. Since it is not obvious which percentage would be most appropriate for estimating the total usage, the average of the four (11%) was used.

The total estimated volume of 3,077,791 gallons of chemical purchased per year corresponds to about 8,432 gallons per day (gpd). About 3,439 gpd

Production Treating Chemical Usage					
CHEMICALS USED, US GALLONS					
COMPANY	1	2	SUBTOTAL	TOTAL	
No. Wells	358	386	744	10,614	
Oil Prod. mmpyd	554	847	1,401	2,554	
Gas Prod. MMSCFD	876	218	1,094	1,466	
Water prod. mmpyd	1,799	2,114	3,913	23,029	
FUNCTION	SOLUBILITY			Estimated*	
Scale Inhibitor	water 0.00	16,476	15,998	32,474	295,218
Corrosion Inhibitor	water 0.00	5,549	9,305	14,854	15,036
Bactericide	water 0.00	111	7,717	7,828	71,164
Reverse Breaker, etc	water 0.00	4,791	56,298	61,089	555,355
Oxygen Scavengers	water 0.00	0	0	0	0
Surfactants, Cleaners	water 0.00	19,290	2,162	21,452	195,018
Emulsion Breakers	water 0.00	0	373	373	3,391
Paraffin control	water 0.00	54,145	11,180	65,325	593,864
Total Chemicals	water 0.00	46,217	91,853	138,070	1,255,182
	%	27	55	41	41
	0.00	125,743	74,744	200,487	1,822,609
	Both	171,960	166,597	338,557	3,077,791
* Liquid production in millions of gallons per year. 1,000,000 '00 = 15,000 mmpyd; 1,000 mmpyd = 652,000 '00 Estimated total chemical usage assumes completions usage was 11% of total usage. See text.					
Table 9. Production Treating Chemicals Used in the Gulf of Mexico during 1988.					

goes into the water phase, with an even smaller volume (estimated 2,100 gpd) actually being discharged to the Gulf of Mexico. This volume of chemical is diluted with about 63,000,000 gpd of produced water, for an average discharge concentration of about 30 ppm. This total volume is distributed through many widely scattered discharge points.

Gas Processing Chemicals. Data on consumption of the gas processing chemicals were obtained from two companies, which had very different processing requirements. Company 1 processed very little gas offshore, perhaps less than 10% of the 320,000 MMSCF produced in 1988. Their consumption of 6,316 gallons TEG and 17,652 gallons of methanol is relatively low but meaningless without definition of the quantities of gas actually treated. Company 2 consumed 52,833 gallons of TEG in dehydrating 90% of their 79,500 MMSCF gas, or 0.74 gallons/MMSCF. This averaged about 11 gallons/day for each dehydration system, essentially all of which carried over into the gas to shore. None of their systems were changed out in 1988. Hydrate inhibition required 370,049 gallons of methanol to treat about 39,000 MMSCF, mostly during the cooler part of the year. This treatment rate averages just under 10 gallons/MMSCF.

It is not felt that the available data warrants any estimation of total consumption of gas treating chemicals. However, some significant observations can be drawn from the Company 2 data. It is apparent that the TEG losses to the gas pose little environmental risk. Even if all the TEG were carried into a proportionate amount of their produced water, it would only amount to 28 ppm, far below the LC50 of 10,000 ppm or more. Even the larger volume of methanol amounts to only 357 ppm if all were dissolved in 49% of the produced water. Again this average concentration is far below the LC50 values of 10,000 ppm or higher. Furthermore, a substantial portion of the methanol will end up in the gas and oil phases, not in the water. Since the methanol concentration in the water must have been in the percentage ranges to provide effective inhibition, a high degree of dilution occurs prior to discharge. Obviously such generalizations and averages can be misleading, but the gas treating and processing are rather uniformly scattered throughout the Company 2 operations. It seems very unlikely that the gas processing chemicals will pose a risk to the environment, but use of methanol will require evaluation for platforms with little or no produced water to dilute the treated condensed water.

Stimulation and Workover Chemicals. Moore⁹ recently compiled a summary of well service activity for the oil production industry in 1988. The survey provided a breakdown as to types of activities and

geographical area. While it is difficult to be sure that the various classifications are consistent with those used by the participants in this current survey, Moore's data provides a solid basis for a reasonable estimate of total chemical consumption. Pertinent statistics from his summary are shown in Table 10. As noted, the offshore Alaskan data were not broken out.

It is apparent from Table 10 that over 80% of the offshore wells in the US are in the Gulf of Mexico, partial justification for the heavy emphasis of the area in this report. About 2% of the wells are being stimulated by acidizing each year, with another 2% being completed or recompleted. Most of the artificial lift repair work will be performed on gas lift wells, which usually does not require pulling the tubing or using brine kill fluids. Repair of tubulars (1-2%) will require pulling the tubing, but may or may not require using kill fluids.

Acidizing chemical data were obtained from all four companies covering at least part of their operations (Table 11). The data covered operations of 1,666 wells in the Gulf of Mexico, or 16% of the total wells. The 145 acid jobs represents 56% of the total jobs reported by Moore. The 259 total jobs per year corresponds to about five per week in the Gulf of Mexico. The various concentrations and types of acids were converted to the equivalent volume of

WELL SERVICING ACTIVITY			
	Gulf of Mexico	Offshore Calif.	Alaska ^a
Total Wells	10614	2090	355
Stimulation	259 (2.4) ^b	28 (1.3)	3 (1.6)
Completions	162 (1.5)	36 (1.7)	30 (8.5)
Artificial Lift Install, Repair	1401 (13.2)	180 (8.6)	53 (14.9)
Tubular Repair	91 (0.9)	44 (2.1)	5 (1.4)
Total Jobs % Wells	1917 (18.0)	288 (13.8)	86 (24.0)
Recompletions, Not included	320 (3.0)	24 (1.1)	3 (0.8)
a. Estimate only, based on 25% of wells and service offshore. Data not broken into offshore/onshore categories.			
b. Values in parenthesis are percent of wells in region.			
Table 10. Summary of Offshore Stimulation and Workover Activity in the U.S.			

15% hydrochloric acid, based on available hydrogen ion. The conversion did not take density differences or chemical activity coefficients into consideration.

The total acid used in the Gulf in 1988 is estimated to range from 541,000 gal. based on number of jobs to 1,890,000 gal. based on number of wells. The average job was about 2,000 gal. Most of this acid will have been reacted downhole, but some small, unknown fraction will be discharged. Residual acidity is apparently not routinely measured by the operators. This spent acid will be commingled with produced water from other layers in that well and further diluted with produced water from other wells before it is discharged. The corrosion inhibitor would be partially adsorbed in the formation as well as being similarly diluted. It seems unlikely that small amounts of remaining acidity, the corrosion inhibitor, or the calcium and iron reaction products would cause any adverse effect. Larger amounts of unreacted acid could cause a significant temporary pH shift in the vicinity of the discharge.

Workover fluid usage was less well defined. The distinction between drilling and workovers as defined in this report does not necessarily match other definitions in the industry. Records for the operating companies apparently do not summarize the quantities of brines used for either. In many instances the brines used are mixtures, so purchases of specific materials may not be directly related to volumes used. Furthermore, dry salts are often added to purchased brines to make fine adjustments to density or compensate for dilution by produced

ACIDIZING IN THE GULF OF MEXICO					
Company/Area	1	2	3	4	Total
Number Wells	358	386	600	322	1666
No. Acid Jobs	19	19	80	27	145
% Acidized	5.3	4.9	13.3	8.4	8.7
Acids Used, equivalent gal. 15% HCl					
Hydrochloric	10741	46300	168000	4509	229550
Hydrofluoric	0	8363	61320	0	69683
Acetic	0	3660	0	0	3660
Total Acid	10741	58323	229320	4509	302893
Average Job	565	3070	2867	167	2089

Table 11. Summary of Acids Used in Stimulation in the Gulf of Mexico

water. Many wells only require seawater to contain the pressure.

It is not felt that the data are sufficiently defined to make any estimates of total consumption. Yet some significant conclusions can be drawn from the information submitted by three companies. Company 1 purchased only 44,683 galloos total brines for their 358 wells, but noted that seawater was adequate for most workovers. Company 2 provided

data on amounts of purchased chemical and number of jobs (28 on 386 wells) involving the brines (Table 12). Company 3 provided estimates on the approximate number and types of chemicals used for an average size job (8400 gal) in an average year (85 jobs on 600 wells); zinc salts had apparently only been used on one or two wells in their entire operating history.

The combined data for these three companies indicate that more than 95% of the workover fluids will be seawater, sodium chloride, or calcium chloride

Company	2		3	
Brine	US Gal.	%	Jobs	%
Sodium/Potassium Chloride	498,960	57	57	67
Calcium Chloride	174,048	20	19	22
Calcium Bromide/Chloride	149,940	17	9	11
Zinc/Calcium Bromide	54,054	6	<1	<1
Total	840,002	100	85	100

Table 12. Summary of Data on Dense Brines Used in the Gulf of Mexico

brines. Some potassium chloride or occasionally some ammonium chloride may be added to minimize clay swelling. The seawater already contains about 19,000, 10,500, 380, and 65 ppm of chloride, sodium, potassium and bromide ions respectively. Thus only zinc or very high concentrations of bromide ions are of major concern. The zinc bromide brines are used in very few wells, probably less than 1% overall, and are normally displaced and returned to shore after completion operations are finished. The brines containing calcium bromide are used slightly more frequently, perhaps a few percent. Of the additives that might be present in the brine, only biocide seems likely to pose any significant risk. Mixing with produced water from that well or other wells will dilute the brines substantially prior to discharge.

SUMMARY

Treating chemicals can be and are used for a number of different purposes in offshore oil and gas production operations. These chemicals are normally only used in response to observed operational problems. Required doses are usually minimized based on results of monitoring programs and operational results. Most of these chemicals are proprietary mixtures of complex compounds. Alternative technology is being used in many instances when appropriate, but chemical treating is often the only effective approach.

Evaluation of pertinent data and practices indicate that only low concentrations of the production treating chemicals in the produced water will nor-

mally be discharged. Many of the commonly used chemicals are oil soluble, with perhaps only a fourth of the total production treating chemicals used actually ending up in the effluent water discharge stream. Comparison of available aquatic toxicity data (96 hour LC50) and use concentrations indicates that most of the chemical concentrations in the effluent stream will be at or below the LC50 values prior to discharge to the ocean.

The gas treating chemicals are used at higher concentrations. The dehydration chemicals are used in closed systems and rarely reach the discharge stream at all. Methanol used as a hydrate inhibitor may be discharged with the produced water at higher concentrations than the production treating chemicals. However, the LC50 value is much higher.

Disposal of stimulation and workover fluids is not a routine occurrence. Only about 9% of the wells were acidized in 1988 in the Gulf of Mexico. The acidizing chemicals conceptually could cause a shortterm lowering of the pH near the discharge point if substantial volumes of unspent acid are discharged without neutralization. The dense **sodium and calcium brines used in workovers will not pose a significant risk after even minor dilution.** The zinc bromide brines have the greatest potential impact, but are not commonly used and are banned from discharge. When displaced from a well, they are returned to shore for cleanup and reuse. Aquatic toxicity information on the additives used in stimulation and workover fluids are very limited. However, it appears likely that most will have similar **toxicities and use concentrations to the production treating chemicals.**

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APPENDIX B

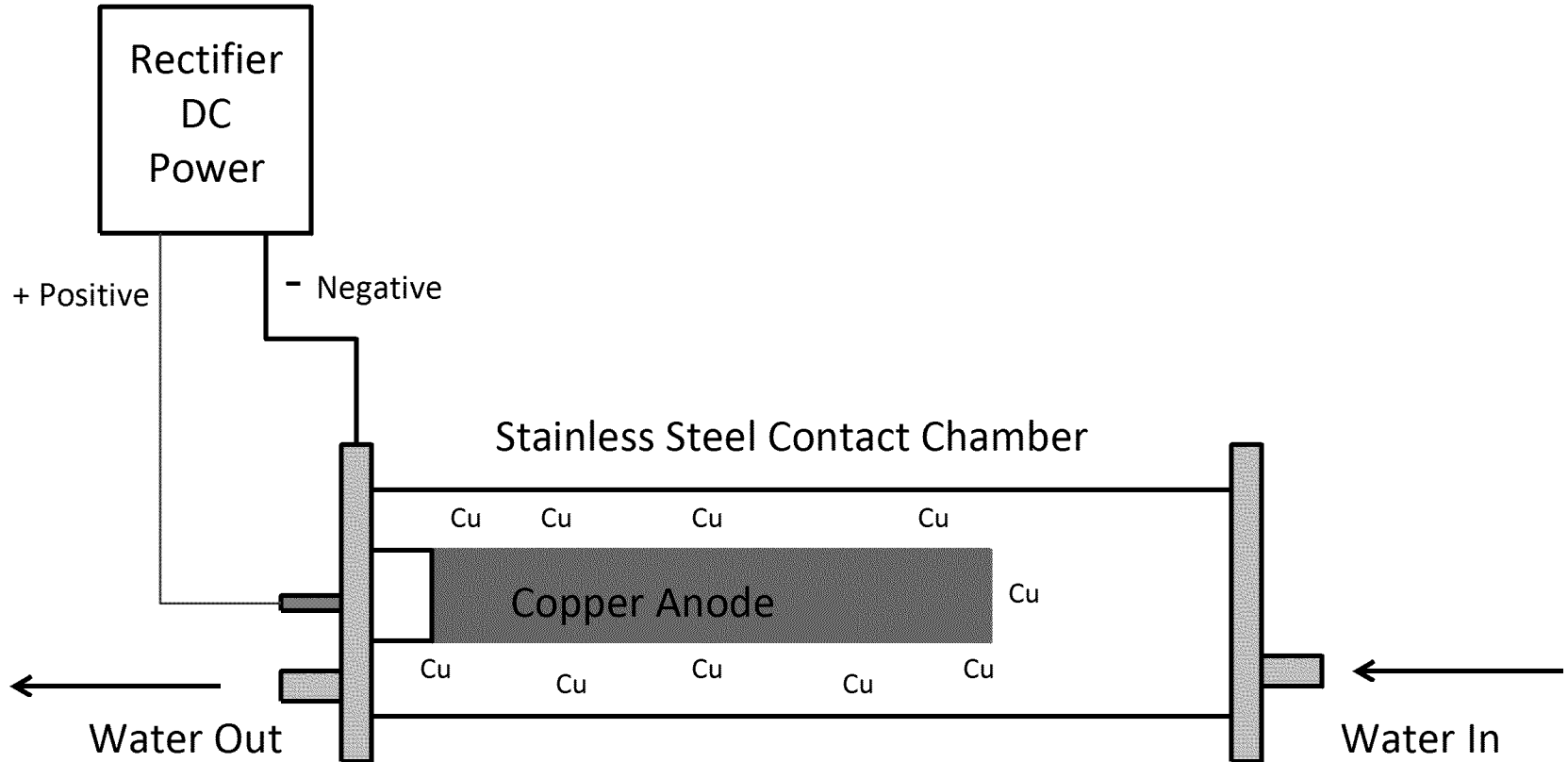
COMMENT NO. 33

Copper Ion Systems

For the Prevention of Marine Growth on Submersible Pumps

Installation and Maintenance

How the Copper Ionizer Works

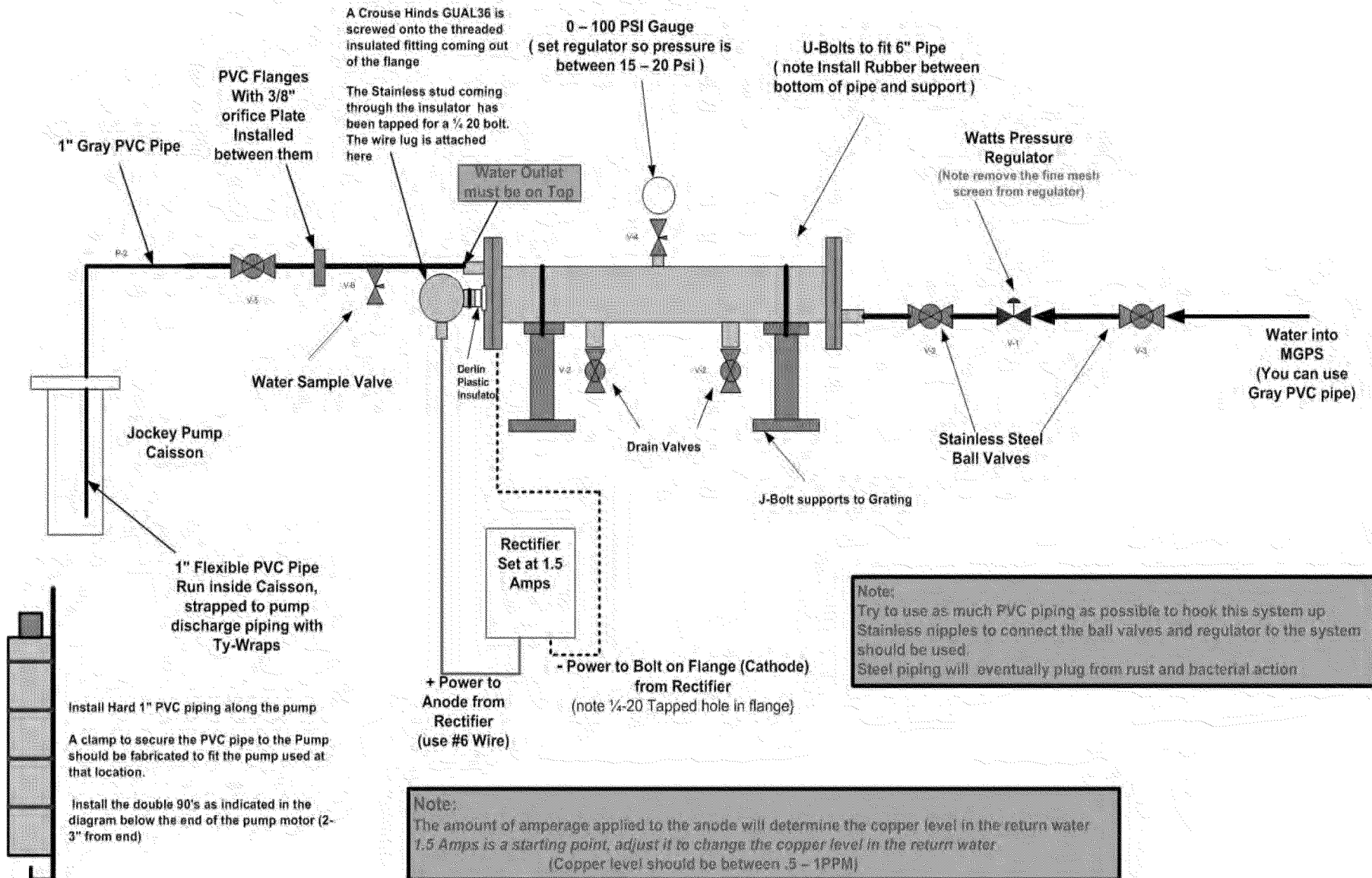


This is basically an electrolysis process. Electrical Current flows between the Copper Anode and Stainless Steel Tank we call a Contact Chamber. The Water flowing through the Contact Tank picks up the Copper Ions which is discharged below the Submersible Pump.

This Copper laden water flowing over the pump prevents marine growth from attaching itself to the pump.

We have found that a .05– 1PPM level of copper is all that is required to prevent fouling

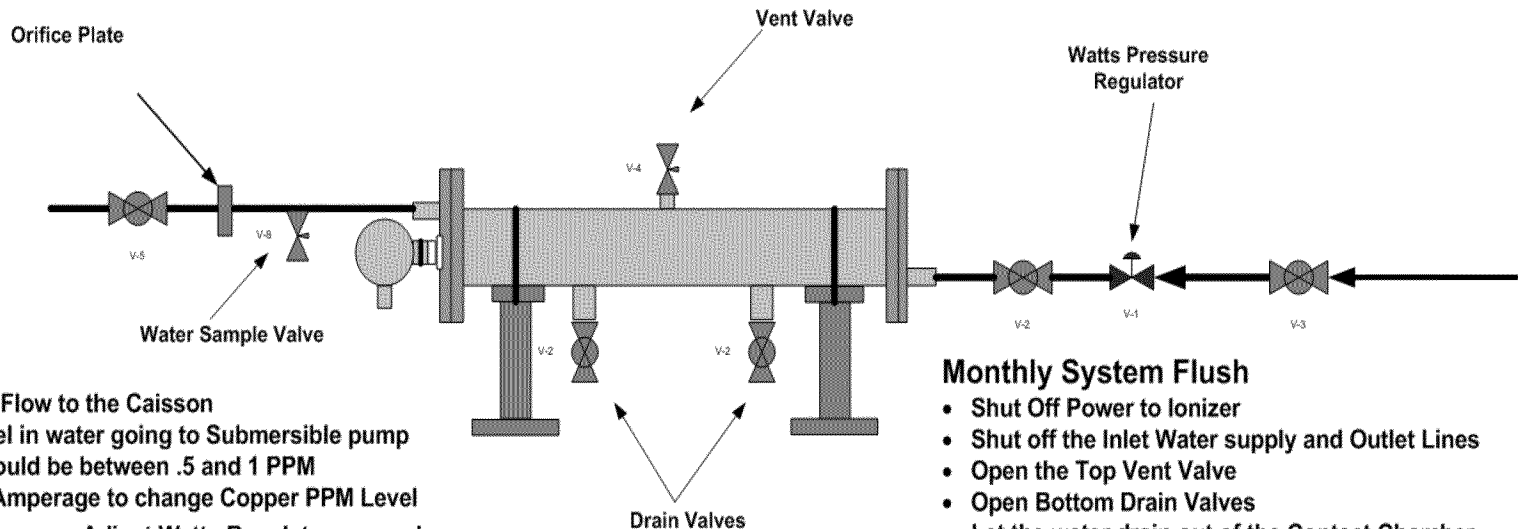
Marine Growth Prevention Copper Ionizer System Installation Guide



Copper Ion System Maintenance

Note:

Anytime the system is being serviced
Cut off the Electrical Power and follow Proper LOTO Procedures.
This is an Electrical Hazard and should be serviced by
Authorized Personnel Only



Weekly

- Check the Water Flow to the Caisson
- Test Copper Level in water going to Submersible pump
- Copper Level should be between .5 and 1 PPM
- Adjust Rectifier Amperage to change Copper PPM Level
- Check Water Pressure – Adjust Watts Regulator as need

Note:

The WATTS Regulator is just used to step down the Fire Water System Pressure going into the Contact Chamber
The Orifice Plate controls the flow out of the Contact Chamber and pressure on it.

Too Large an Orifice and the pressure will be low

Too Small or if it is getting plugged the pressure will go up
Copper will sometimes build up on the orifice plate plugging it

Monthly System Flush

- Shut Off Power to Ionizer
- Shut off the Inlet Water supply and Outlet Lines
- Open the Top Vent Valve
- Open Bottom Drain Valves
- Let the water drain out of the Contact Chamber
- Close Vent Valve Off
- With both bottom drains open, open the water inlet
- Let the water flow out of the Contact Chamber until Clean
- Record how much sediment is washed out

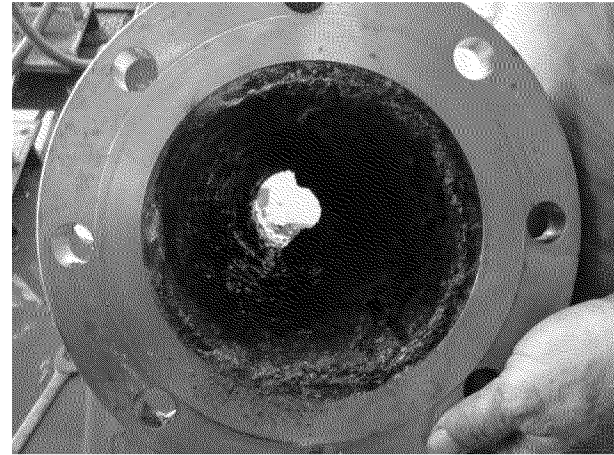
Failure to Flush Sediment May Cause it to Short Out Internally and Cause a Failure or Severe Electrolysis of the Units Housing and Premature Anode Failure

Yearly

- Shutdown the System and Flush
- Remove the Inlet Piping and Flange
- Inspect the Internal Condition of the Contact Chamber
- If significant build up is found on the walls of the Contact Chamber remove the outlet Piping and Flange/Anode Assembly
- Examine the condition of the Copper Anode – How much is left
- Replace Anode as condition warrants

Note: If you do not want to service the System in the field It can be shipped into EXTERRAN's Shop for Rebuilding

Examples of Internal Build Up



Build Up on Walls of Contact Chamber

***As Part of the Electrolysis
Process Copper will build up on
the Inside of the Stainless Steel
Contact Chamber
Other Sediment and Build up
comes from Organics in the
Seawater***



Copper Anode Images

**Anode Assembly backed out
Notice the sediment**



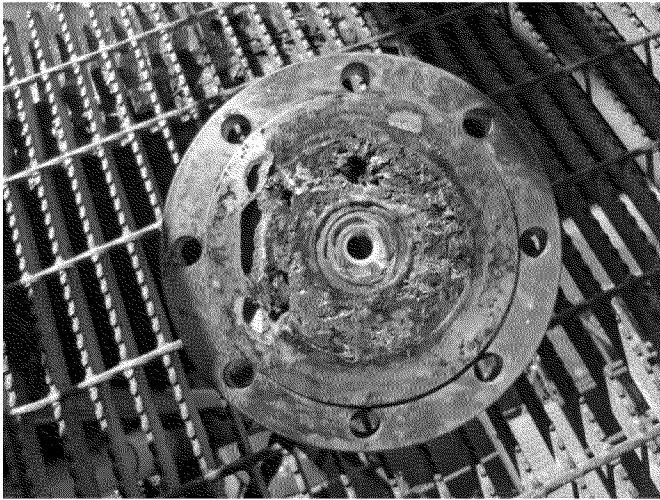
This is Normal Build Up on the Anode



Flange Failure

Failure to Flush Sediments from the Tank will cause severe electrolysis between the Flange and Anode or the Anode and Tank

Below are two examples of Flange Failures

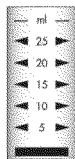


Testing for Copper PPM Level

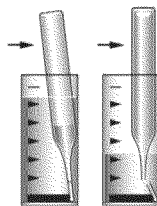
Copper CHEMets®

0 - 1 & 1 - 10 ppm

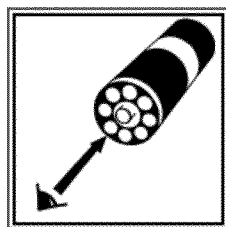
1. Fill the sample cup to the 25 mL mark with the sample (fig 1).



2. Place the CHEMet ampoule in the sample cup. Snap the tip by pressing the ampoule against the side of the cup. The ampoule will fill leaving a small bubble to facilitate mixing (fig 2).



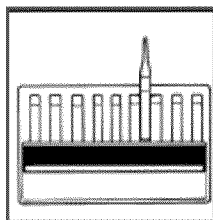
3. Mix the contents of the ampoule by inverting it several times, allowing the bubble to travel from end to end each time. Wipe all liquid from the exterior of the ampoule. Wait **2 minutes for color development**.



4. Use the appropriate comparator to determine the level of copper in the sample. If the color of the CHEMet ampoule is between two color standards, a concentration estimate can be made.

a. Place the CHEMet ampoule, flat end downward into the center tube of the low range comparator. Direct the top of the comparator up toward a source of bright light while viewing from the bottom. Rotate the comparator until the color standard below the CHEMet ampoule shows the closest match

b. Hold the high range comparator in a nearly horizontal position while standing directly beneath a bright source of light. Place the CHEMet ampoule between the color standards moving it from left to right along the comparator until the best color match is found



Reorder Information Cat. No.

Test Kit, complete **K3510**

Refill, 30 CHEMet ampoules **R3510**

Sample Cup, 25 mL, package of six **A0013**

Comparator, 0-1 ppm **C3501**

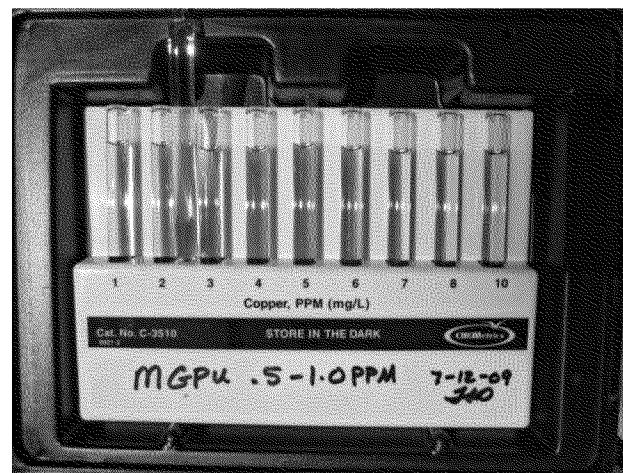
Comparator, 1-10 ppm **C3510**

CHEMetrics, Inc., 4295 Catlett Road, Calverton, VA 20138-0214
U.S.A.

Phone: (800) 356-3072; Fax: (540) 788-4856; E-Mail:
orders@chemetrics.com

www.chemetrics.com Jan. 07, Rev. 5

Example of Copper Test Reading



*Copper PPM Level is Between 2-3 PPM
Need to adjust Amperage Setting so that PPM
Level is between .5 and 1 PPM*

BASIC OPERATING INSTRUCTIONS FOR
RK19 SOLID STATE CONTROL RECTIFIERS
CURRENT LIMIT



MANUAL OPERATION

1. Auto - Manual switch must be in manual position.
2. Link bars must be in lowest setting.
3. Turn rectifier on.
4. Observe output. Adjust link bars to desired output.

NOTE: Solid state controls have no effect in manual mode and need not be adjusted. Solid state printed circuit boards may be removed for inspection or repair in manual mode. Unit will remain operational.

CURRENT LIMIT - CONSTANT CURRENT OPERATION

NOTE:

The CURRENT LIMIT is factory set at rated output of rectifier. If different current limit is desired then proceed with the following steps.

1. With the Auto-Manual Control switch in the Manual position, increase link bars to obtain a current output slightly higher than required, but still within the rating of the rectifier.
2. Turn Rectifier OFF and adjust CURRENT LIMIT knobs fully clockwise.
3. Place the Auto-Manual switch in the AUTO mode.
4. Turn Rectifier on. Output should return to the output as adjusted in step one above.
5. Adjust CURRENT LIMIT control counter clockwise (decrease) to desired current output. Rectifier will maintain this current setting with nominal circuit resistance changes. If there is an extreme change in external load circuit resistance, link bars may need to be at a higher setting to maintain the preset current. Constant current operation is a function of the current limit feature of this unit

TROUBLE SHOOTING HINTS

NOTE: A wiring diagram for use by experienced personnel is provided. Only experienced electrical personnel should attempt location and repair of electrical difficulties, should they occur. Some symptoms of elementary trouble and the possible remedy are as follows:

1. NO D.C. CURRENT OR D.C. VOLTAGE OUTPUT.

CHECK: A.C. overload protection for blown fuses or tripped breaker. Check A.C. power supply.(Is desired potential maintained?) If desired potential is maintained then unit has automatically cut back output of rectifier to maintain potential.

2. D.C. VOLTAGE BUT NO D.C. CURRENT READING.

CHECK: D.C. ammeter. Check D.C. connections and external D.C. circuit for electrical continuity.

3. D.C. CURRENT READING BUT NO D.C. VOLTAGE READINGS.

CHECK: Check D.C. voltmeter.

4. MAXIMUM RATED D.C. VOLTAGE CANNOT BE ATTAINED.

CHECK: A.C. line voltage. Check link bar adjustments for maximum.

Check accuracy of D.C. voltmeter. Check that unit is not operating against a preset voltage and or current limit.

5. MAXIMUM RATED D.C. CURRENT CANNOT BE ATTAINED.

CHECK: Load resistance of external D.C. circuit. Check that unit is not operating against a preset voltage and or current limit.

6. REFERENCE METER PEGGED FULL SCALE AND NO D.C. OUTPUT.

CHECK: Electrode and Structure connections and external reference circuit for electrical continuity.

NOTE: Give model and serial numbers when writing or calling Universal Rectifiers Inc. in reference to this rectifier.

For Parts and Service

Replacement Anodes and Parts or for Shop Repair



Craig Clements

Belle Chasse, La

Phone: 504-392-2600

Rectifier Parts

Universal Rectifiers, Inc.

P.O. Box 1640

1631 Cottonwood School Rd.

Rosenberg, Texas 77471

(281) 342-8471 - (281) 342-0292 Fax:

www.universalrectifiers.com

For Technical Information

Scott Reppel

Lead Principal Investigator

Chevron USA

Eastern Gulf of Mexico

Harvey Office

Phone: 504-263-6890

Cell: 504-289-1701

APPENDIX C

COMMENT NO. 33

	Ion	Pipe Dia	Critical	Collection	<i>M. beryllina</i> Survival			<i>M. bahia</i> Survival			Copper Ion analysis	
Area & Block	Treatment	(in)	Dilution (%)	Date	NOEC	LOEC	Pass/Fail	NOEC	LOEC	Pass/Fail	(mg/L)	Comment
Mobile 904 AQ	Cu	6	1.48	06/09/14	5.92	>5.92	P	5.92	>5.92	P	0.5	Copper Ion treatment only EPA Region 4/7-Day NOEC testing
Mobile 904 AQ	Cu	6	1.48	08/04/14	5.92	>5.92	P	5.92	>5.92	P	0.99	Copper Ion treatment only EPA Region 4/7-Day NOEC testing
Mobile 904 AQ	Cu	6	1.48	10/27/14	5.92	>5.92	P	5.92	>5.92	P	Not measured	Copper Ion treatment only EPA Region 4/7-Day NOEC testing
Mobile 904 AQ	Cu	6	1.48	01/05/15	5.92	>5.92	P	5.92	>5.92	P	Not measured	Copper Ion treatment only EPA Region 4/7-Day NOEC testing
Mobile 904 AQ	Cu	6	1.48	07/13/15	5.92	>5.92	P	2.96	5.92	P	Not measured	Copper Ion treatment only EPA Region 4/7-Day NOEC testing
Mobile 904 AQ	Cu	6	1.48	01/11/16	5.92	>5.92	P	5.92	>5.92	P		
Mobile 904 AQ	Cu	6	1.48	06/15/16	2.96	5.92	p	5.92	>5.92	P		
Mobile 904 AQ	Cu	6	1.48	09/01/16	5.92	>5.92	p	5.92	>5.92	P		
Mobile 904 AQ	Cu	6	1.23	03/09/17	4.92	>4.92	p	4.92	>4.92	p		
Mobile 916 AP	Cu	2	0.29	01/13/14	1.16	>1.16	P	1.16	>1.16	P	Not measured	Copper Ion treatment only EPA Region 4/7-Day NOEC testing
Mobile 916 AP	Cu	2	0.29	04/07/14	1.16	>1.16	P	1.16	>1.16	P	Not measured	Copper Ion treatment only EPA Region 4/7-Day NOEC testing
Mobile 916 AP	Cu	2	0.29	06/17/14	1.16	>1.16	P	1.16	>1.16	P	Not measured	Copper Ion treatment only EPA Region 4/7-Day NOEC testing
Mobile 916 AP	Cu	2	0.29	07/14/14 07/28/14	1.16	>1.16	P	1.16	>1.16	P	BDL	Copper Ion treatment only EPA Region 4/7-Day NOEC testing
Mobile 916 AP	Cu	2	0.29	01/05/15	1.16	>1.16	P	1.16	>1.16	P	Not measured	Copper Ion treatment only EPA Region 4/7-Day NOEC testing
Mobile 916 AP	Cu	2	0.29	07/13/15	1.16	>1.16	P	1.16	>1.16	P	Not measured	Copper Ion treatment only EPA Region 4/7-Day NOEC testing
Mobile 916 AP	Cu	2	0.29	01/11/16	1.16	>1.16	P	1.16	>1.16	P		
Mobile 916 AP	Cu	2	0.29	06/15/16	1.16	>1.16	P	1.16	>1.16	P		
Mobile 916 AP	Cu	2	0.29	09/01/16	1.16	>1.16	P	1.16	>1.16	P		
MP 142 C	Cu	3	12.4	12/25/13	49.6	>49.6	P	49.6	>49.6	P	Not measured	Copper Ion treatment only
MP 142 C	Cu	3	12.4	01/14/14	49.6	>49.6	P	49.6	>49.6	P	Not measured	Copper Ion treatment only
MP 144 A	Cu	3	12.4	12/25/13	24.8	49.6	P	12.4	24.8	P	Not measured	Copper Ion treatment only
MP 144 A	Cu	3	12.4	01/14/14	49.6	>49.6	P	49.6	>49.6	P	Not measured	Copper Ion treatment only
MP 300 B	Cu	3	12.4	12/25/13	49.6	>49.6	P	49.6	>49.6	P	Not measured	Copper Ion treatment only
MP 300 B	Cu	3	12.4	01/14/14	49.6	>49.6	P	49.6	>49.6	P	Not measured	Copper Ion treatment only
MP 42 M	Cu	2	11.2	01/26/14	11.2	22.4	P	22.4	44.8	P	Not measured	Copper Ion treatment only
MP 42 M	Cu	2	11.2	04/15/14	44.8	>44.8	P	44.8	>44.8	P	Not measured	Copper Ion treatment only
MP 42 M	Cu	2	11.2	05/13/14	44.8	>44.8	P	44.8	>44.8	P	BDL	Copper Ion treatment only
MP 42 M	Cu	2	11.2	06/03/14	44.8	>44.8	P	44.8	>44.8	P	BDL	Copper Ion treatment only
MP 42 M	Cu	2	11.2	07/01/14	44.8	>44.8	P	44.8	>44.8	P	BDL	Copper Ion treatment only
MP 42 M	Cu	2	11.2	08/05/14	44.8	>44.8	P	44.8	>44.8	P	BDL	Copper Ion treatment only
MP 42 M	Cu	2	11.2	09/02/14	22.4	44.8	P	22.4	44.8	P	BDL	Copper Ion treatment only
MP 42 M	Cu	2	11.2	10/15/14	11.2	22.4	P	11.2	22.4	P	Not measured	Copper Ion treatment only
MP 42 M	Cu	2	11.2	11/12/14	44.8	>44.8	P	44.8	>44.8	P	Not measured	Copper Ion treatment only
MP 42 M	Cu	2	11.2	12/11/14	44.8	>44.8	P	44.8	>44.8	P	Not measured	Copper Ion treatment only
MP 42 M	Cu	2	11.2	01/06/15	11.2	22.4	P	11.2	22.4	P	Not measured	Copper Ion treatment only
MP 42 M	Cu	2	11.2	02/03/15	44.8	>44.8	P	44.8	>44.8	P	Not measured	Copper Ion treatment only
MP 42 M	Cu	2	11.2	03/01/16	44.8	>44.8	P	44.8	>44.8	P		
SMI 236 A	Cu	2	11.2	12/16/13	44.8	>44.8	P	44.8	>44.8	P	Not measured	Copper Ion treatment only
SMI 236 A	Cu	2	11.2	01/21/14	44.8	>44.8	P	44.8	>44.8	P	Not measured	Copper Ion treatment only
SMI 236 A	Cu	2	11.2	04/08/14	44.8	>44.8	P	44.8	>44.8	P	Not measured	Copper Ion treatment only
SMI 236 A	Cu	2	11.2	05/06/14	44.8	>44.8	P	44.8	>44.8	P	Not measured	Copper Ion treatment only
SMI 236 A	Cu	2	11.2	06/03/14	44.8	>44.8	P	44.8	>44.8	P	BDL	Copper Ion treatment only
SMI 236 A	Cu	2	11.2	07/08/14	44.8	>44.8	P	22.4	44.8	P	BDL	Copper Ion treatment only
SMI 236 A	Cu	2	11.2	08/05/14	44.8	>44.8	P	44.8	>44.8	P	BDL	Copper Ion treatment only
SMI 236 A	Cu	2	11.2	11/25/14	11.2	22.4	P	22.4	44.8	P	BDL	Copper Ion treatment only
SMI 236 A	Cu	2	11.2	12/09/14	44.8	>44.8	P	44.8	>44.8	P	Not measured	Copper Ion treatment only
SMI 236 A	Cu	2	11.2	01/06/15	44.8	>44.8	P	44.8	>44.8	P	Not measured	Copper Ion treatment only

SMI 236 A	Cu	2	11.2	02/03/15	44.8	>44.8	P	44.8	>44.8	P	Not measured	Copper Ion treatment only
SMI 236 A	Cu	2	11.2	03/03/15	44.8	>44.8	P	44.8	>44.8	P	Not measured	Copper Ion treatment only
SMI 236 A	Cu	2	11.2	01/05/16	44.8	>44.8	P	44.8	>44.8	P		
SMI 236 A	Cu	1.5	11.2	01/10/17	44.8	>44.8	P	44.8	>44.8	P		
SMI 236 A	Cu	1.5	11.2	03/28/17	44.8	>44.8	P	44.8	>44.8	P		
ST 151 P1	Cu	2	12.4	01/16/14	49.6	>49.6	P	49.6	>49.6	P	Not measured	Copper Ion treatment only
ST 37 J	Cu	>6	14	09/16/15	56	>56	P	56	>56	P	Not measured	Copper Ion treatment only
ST 37 J	Cu	>6	14	10/12/15	56	>56	P	56	>56	P		
ST 37 J	Cu	>6	14	11/04/15	56	>56	P	56	>56	P		
ST 37 J	Cu	>6	14	12/17/15	56	>56	P	56	>56	P		
ST 37 J	Cu	>6	14	03/02/16	56	>56	P	56	>56	P		
ST 37 J	Cu	>6	14	05/12/16	56	>56	P	56	>56	P		
ST 52 A	Cu	2	12.4	01/15/14	49.6	>49.6	P	49.6	>49.6	P	Not measured	Copper Ion treatment only
ST 52 A	Cu	2	11.2	04/08/14	22.4	44.8	P	11.2	22.4	P	Not measured	Copper Ion treatment only
ST 52 A	Cu	2	11.2	07/10/14	44.8	>44.8	P	22.4	44.8	P	Not measured	Copper Ion treatment only
ST 52 A	Cu	2	11.2	10/16/14	44.8	>44.8	P	44.8	>44.8	P	Not measured	Copper Ion treatment only
ST 52 A	Cu	2	11.2	02/05/15	44.8	>44.8	P	44.8	>44.8	P	Not measured	Copper Ion treatment only
ST 52 A	Cu	2	11.2	02/10/16	44.8	>44.8	P	44.8	>44.8	P		
VK 900 A	Cu	3	12.4	01/22/14	49.6	>49.6	P	49.6	>49.6	P	Not measured	Copper Ion treatment only
WD 109 A	Cu	3	12.4	12/30/13	49.6	>49.6	P	49.6	>49.6	P	Not measured	Copper Ion treatment only
WD 109 A	Cu	3	12.4	01/22/14	49.6	>49.6	P	49.6	>49.6	P	Not measured	Copper Ion treatment only
GC 338 (Front Runner)	Cu & Al	16	20	01/16/14	80	>80	P	80	>80	P	Not measured	Copper and Aluminum Ions
GC 338 (Front Runner)	Cu & Al	16	20	02/13/14	80	>80	P	80	>80	P	Not measured	Copper and Aluminum Ions
GC 338 (Front Runner)	Cu & Al	16	20	03/06/14	80	>80	P	80	>80	P	Not measured	Copper and Aluminum Ions
GC 338 (Front Runner)	Cu & Al	16	20	04/24/14	80	>80	P	80	>80	P	Not measured	Copper and Aluminum Ions
GC 338 (Front Runner)	Cu & Al	16	20	05/20/14	80	>80	P	80	>80	P	Not measured	Copper and Aluminum Ions
GC 338 (Front Runner)	Cu & Al	16	20	06/10/14	80	>80	P	80	>80	P	Not measured	Copper and Aluminum Ions
GC 338 (Front Runner)	Cu & Al	16	20	07/08/14	80	>80	P	80	>80	P	Not measured	Copper and Aluminum Ions
GC 338 (Front Runner)	Cu & Al	16	20	08/13/14	80	>80	P	80	>80	P	Not measured	Copper and Aluminum Ions
GC 338 (Front Runner)	Cu & Al	16	20	09/18/14	80	>80	P	80	>80	P	Not measured	Copper and Aluminum Ions
GC 338 (Front Runner)	Cu & Al	16	20	10/28/14	80	>80	P	80	>80	P	Not measured	Copper and Aluminum Ions
GC 338 (Front Runner)	Cu & Al	16	20	11/05/14	80	>80	P	80	>80	P	Not measured	Copper and Aluminum Ions
GC 338 (Front Runner)	Cu & Al	16	20	12/09/14	80	>80	P	80	>80	P	Not measured	Copper and Aluminum Ions
GC 338 (Front Runner)	Cu & Al	16	20	11/18/15	80	>80	P	80	>80	P		
GC 338 (Front Runner)	Cu & Al	16	20	11/22/16	80	>80	P	80	>80	P		
MC 736 (Thunder Hawk)	Cu & Fe	14	20	01/15/14	80	>80	P	80	>80	P	Not measured	Copper and Iron Ions
MC 736 (Thunder Hawk)	Cu & Fe	14	20	02/13/14	80	>80	P	80	>80	P	Not measured	Copper and Iron Ions
MC 736 (Thunder Hawk)	Cu & Fe	14	20	03/06/14	80	>80	P	80	>80	P	Not measured	Copper and Iron Ions
MC 736 (Thunder Hawk)	Cu & Fe	14	20	04/24/14	80	>80	P	80	>80	P	Not measured	Copper and Iron Ions
MC 736 (Thunder Hawk)	Cu & Fe	14	20	05/20/14	80	>80	P	80	>80	P	Not measured	Copper and Iron Ions
MC 736 (Thunder Hawk)	Cu & Fe	14	20	06/10/14	80	>80	P	80	>80	P	Not measured	Copper and Iron Ions
MC 736 (Thunder Hawk)	Cu & Fe	14	20	07/08/14	80	>80	P	80	>80	P	Not measured	Copper and Iron Ions
MC 736 (Thunder Hawk)	Cu & Fe	14	20	08/11/14	80	>80	P	80	>80	P	Not measured	Copper and Iron Ions
MC 736 (Thunder Hawk)	Cu & Fe	14	20	09/11/14	80	>80	P	80	>80	P	Not measured	Copper and Iron Ions
MC 736 (Thunder Hawk)	Cu & Fe	14	20	10/09/14	80	>80	P	80	>80	P	Not measured	Copper and Iron Ions
MC 736 (Thunder Hawk)	Cu & Fe	14	20	11/06/14	80	>80	P	80	>80	P	Not measured	Copper and Iron Ions
MC 736 (Thunder Hawk)	Cu & Fe	14	20	12/03/14	80	>80	P	80	>80	P	Not measured	Copper and Iron Ions
MC 736 (Thunder Hawk)	Cu & Fe	14	20	11/19/15	80	>80	P	80	>80	P		
MC 736 (Thunder Hawk)	Cu & Fe	8	20	08/26/16	40	80	P	20	40	P		
AT618	Cu	5.9	23	10/28/14	92	>92	P	92	>92	P	Not measured	Copper Ion treatment only
AT618	Cu&Al	11.8	20	10/28/14	40	80	P	80	>80	P	Not measured	Copper and Aluminum Ions
AT618	Cu&Al	17.7	14	10/28/14	56	>56	P	56	>56	P	Not measured	Copper and Aluminum Ions
AT618	Cu	5.9	23	11/07/14	92	>92	P	92	>92	P	Not measured	Copper Ion treatment only
AT618	Cu&Al	9.8	20	11/07/14	80	>80	P	80	>80	P	Not measured	Copper and Aluminum Ions
AT618	Cu&Al	17.7	14	11/07/14	64	>64	P	64	>64	P	Not measured	Copper and Aluminum Ions
GC610	Cu&Al	9.8	20	11/20/14	80	>80	P	80	>80	P	Not measured	Copper and Aluminum Ions
GC610	Cu	5.9	23	11/20/14	92	>92	P	92	>92	P	Not measured	Copper Ion treatment only
GC610	Cu	9.8	20	11/20/14	80	>80	P	80	>80	P	Not measured	Copper Ion treatment only
GC653	Cu	20	20	12/01/14	80	>80	P	80	>80	P	Not measured	Copper Ion treatment only
GC653	Cu	5.9	23	12/29/14	92	>92	P	92	>92	P	Not measured	Copper Ion treatment only
GC653	Cu&Al	9.8	20	12/29/14	80	>80	P	80	>80	P	Not measured	Copper and Aluminum Ions
GC610	Cu	9.8	20	01/28/15	80	>80	P	80	>80	P	Not measured	Copper Ion treatment only
GC610	Cu&Al	5.9	23	01/28/15	92	>92	P	92	>92	P	Not measured	Copper and Aluminum Ions
GG610	Cu	5.91	23	02/26/15	92	>92	P	92	>92	P	Not measured	Copper Ion treatment only
GC653	Cu&Al	11.81	20	02/26/15	80	>80	P	80	>80	P	Not measured	Copper and Aluminum Ions
GC653	Cu	4.5	23	03/25/15	92	>92	P	92	>92	P	Not measured	Copper Ion treatment only

GC653	Cu&Al	10	20	03/25/15	80	>80	P	80	>80	P	Not measured	Copper and Aluminum Ions
GC653	Cu	4.5	23	04/01/15	90	>92	P	92	>92	P	Not measured	Copper Ion treatment only
GC653	Cu&Al	10.7	20	04/01/15	80	>80	P	80	>80	P	Not measured	Copper and Aluminum Ions
GC653	Cu	11.8	20	04/01/15	80	>80	P	80	>80	P	Not measured	Copper Ion treatment only
GC609	Cu&Al	11.8	20	04/28/15	80	>80	P	80	>80	P	Not measured	Copper and Aluminum Ions
GC609	Cu&Al	17.7	24.6	04/28/15	98.4	>98.4	P	98.4	>98.4	P	Not measured	Copper and Aluminum Ions
GC609	Cu	11.8	20	04/28/15	80	>80	P	80	>80	P	Not measured	Copper Ion treatment only
GC609	Cu&Al	17.7	24.6	05/31/15	98.4	>98.4	P	98.4	>98.4	P	Not measured	Copper and Aluminum Ions
GC609	Cu	5.91	23	05/31/15	92	>92	P	92	>92	P	Not measured	Copper Ion treatment only
GC609	Cu&Al	9.84	20	05/31/15	80	>80	P	80	>80	P	Not measured	Copper and Aluminum Ions
GC609	Cu&Al	17.72	20	06/01/15	80	>80	P	80	>80	P	Not measured	Copper and Aluminum Ions
GC609	Cu&Al	17.7	24.6	06/01/15	98.4	>98.4	P	98.4	>98.4	P	Not measured	Copper and Aluminum Ions
GC609	Cu	5.91	23	06/01/15	92	>92	P	92	>92	P	Not measured	Copper Ion treatment only
GC609	Cu	6	23	07/01/15	92	>92	P	92	>92	P	Not measured	Copper Ion treatment only
GC609	Cu&Al	12	20	07/01/15	80	>80	P	80	>80	P	Not measured	Copper and Aluminum Ions
GC609	Cu&Al	12	20	07/01/15	80	>80	P	80	>80	P	Not measured	Copper and Aluminum Ions
GC609	Cu	5.91	23	08/05/15	92	>92	P	92	>92	P	Not measured	Copper Ion treatment only
GC609	Cu&Al	17.72	20	08/05/15	80	>80	P	80	>80	P	Not measured	Copper and Aluminum Ions
GC609	Cu&Al	17.72	20	08/05/15	80	>80	P	80	>80	P	Not measured	Copper and Aluminum Ions

BDL- Below Detection limit (<0.01 mg/L)

APPENDIX D

COMMENT NO. 36

Tiered Intake Velocity Monitoring Methodology Justification

The Offshore Operators Committee (OOC) commissioned CK Associates (CK) to evaluate if the velocity monitoring frequency, proscribed for CWIS (intakes) by GMG290000, could be reduced from daily to a lesser frequency while remaining protective of species subject to impingement mortality (IM).

CK evaluated one year of data (2015) from six separate CWIS, located in the GOM, for analysis. The intake velocity data are presented on Figure 1. The data presented in Figure 1 show a range of intake velocities measured throughout the year with a minimum velocity equal to 0.02 ft/s, a maximum intake velocity equal to 0.45 ft/s and a mean intake velocity equal to 0.172 ft/s (excluding days of zero intake flow). Gaps in the plots indicate days for which the intake was not operating. Each of the six CWIS maintained intake velocities below the 0.5 ft/s regulatory threshold (zero exceedances) during the calendar year. There is no general trend of increasing velocity for the intakes as a whole. Intake velocities tend to increase and decrease randomly due to fluctuating cooling water needs rather than an accumulation of biomass blocking the screens.

The daily intake velocities were converted to rates-of-change in intake velocity for this analysis. The results are presented as an individual value plot on Figure 2 and represent 1,290 individual velocity monitoring events. Two criteria were used to create the rate-of-change results. Missing data are omitted for purposes of the analysis (not assumed to be zero); any rate-of-change requires two consecutive non-zero velocity measurements. This analysis resulted in 1,290 data points upon which the remainder of the analysis is based. The data show a minimum rate-of-change in intake velocity equal to -0.14 (ft/s)/day, a mean of 0.00 (ft/s)/day, and a maximum of 0.20 (ft/s)/day.

An ANOVA was used to determine if any individual intake differed statistically from the others based on rates-of-change. Interval plots for each intake can be found on Figure 3. No statistically significant differences in rates-of-change were identified for any intake ($P < 0.05$). Individual comparison plots using Tukey's Method can be found on Figure 4.

The rate-of-change data were combined for all subsequent analyses because they do not differ statistically. The combined data set is plotted as a histogram with a normal distribution overlain on Figure 5. The data are approximately normal. However, the spread of the data is less than would be expected of a perfectly normal distribution. Therefore, the normal distribution will provide conservative estimates of mean rates-of-change throughout the remainder of the analysis.

As shown on Figure 5, the mean rate-of-change in intake velocity for the combined data set is equal to 0.00004651 (ft/s)/day with a standard deviation equal to 0.01073 (ft/s)/day. These values were used to calculate the upper 95th percentile value for mean velocity increase over 1 day, 30 days, and 90 days. The results can be found in Table 1. Based on this analysis, a given intake will exhibit an increase in velocity equal to 0.115 ft/s or less during any 30-day period at the 95% confidence level. A given intake will exhibit an increase in velocity equal to 0.200 ft/s or less during any 90-day period at the 95% confidence level.

Table 1: Velocity increase for intakes as a function of days between velocity monitoring events.

Interval Between Consecutive Velocity Monitoring Events (days)	Upper 95% Confidence Interval for Daily Average Velocity Increase (ft/s)/day	Upper 95% Confidence Interval for Velocity Increase during the Interval (ft/s)
1	0.021	0.021
30	0.00384	0.115
90	0.00222	0.200

The information found in Table 1 was used to develop a tiered velocity monitoring frequency that is equally protective of species that are susceptible to IM as the current daily velocity monitoring requirement proscribed in the GMG290000.

Table 2: Tiered intake velocity monitoring frequency based on most-recent intake velocity monitoring data.

If the most recently reported intake velocity was: (ft/s)	Interval between most recent velocity monitoring event, and next monitoring event (days)	95% Velocity at the end of the interval	Proposed Permit Monitoring Frequency
<0.300	90	$<0.300 + <0.200 = <0.500$	Quarterly
0.300 – 0.384	30	$<0.384 + <0.115 = <0.500$	Monthly
>0.384	1	<0.500	Daily

The following points summarize the arguments in support of the tiered intake velocity monitoring frequency approach:

- Of the six intakes included in this evaluation, zero exceeded the 0.5 ft/s intake velocity threshold during 2015 (Figure 1);
- Intake velocity does not monotonically increase over time (Figure 1);
- There is no statistically significant difference in rate-of-change for intake velocity across the six intakes included in the study ($P < 0.05$). Therefore a general approach to all intakes, as opposed to a site-specific monitoring methodology, is appropriate (Figures 2 – 5); and
- The tiered approach presented in Table 2 ensures that intake velocity measurements will be made prior to exceeding the 0.5 ft/s regulatory threshold. Therefore, the tiered velocity monitoring frequency is equally protective of species susceptible to IM as is the current daily intake velocity monitoring requirement proscribed in the GMG290000.

Figure 1: Daily Intake Velocity

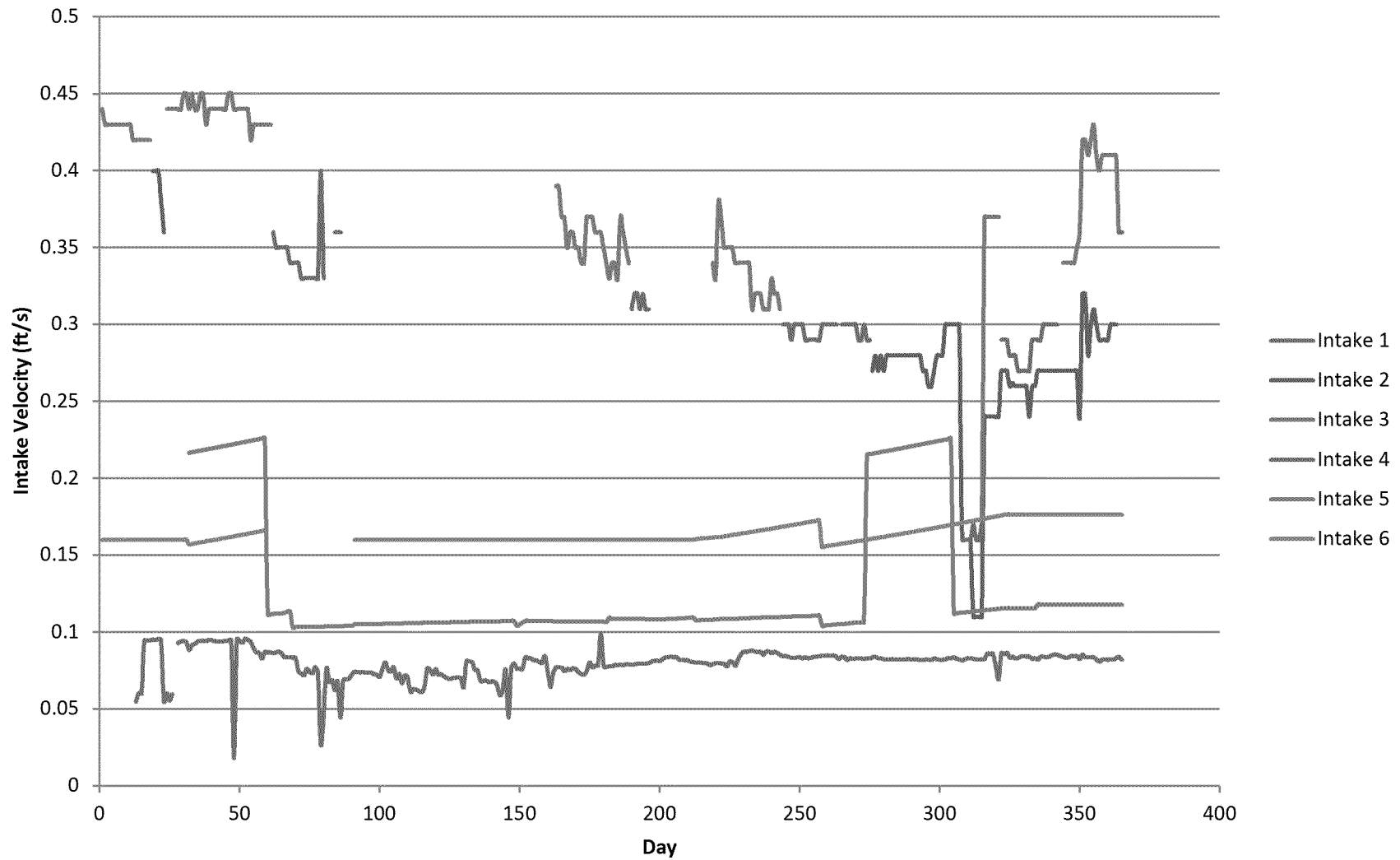
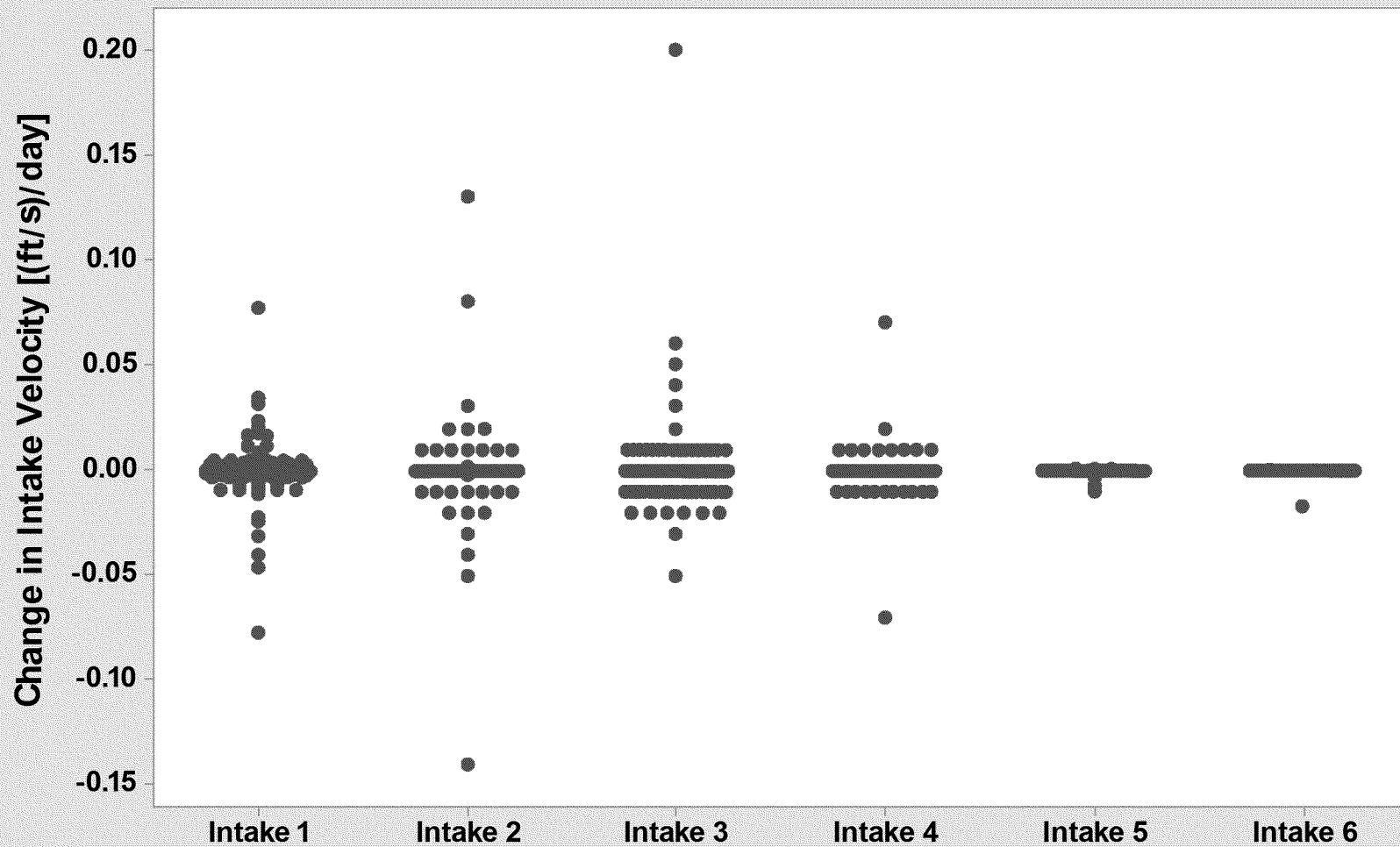
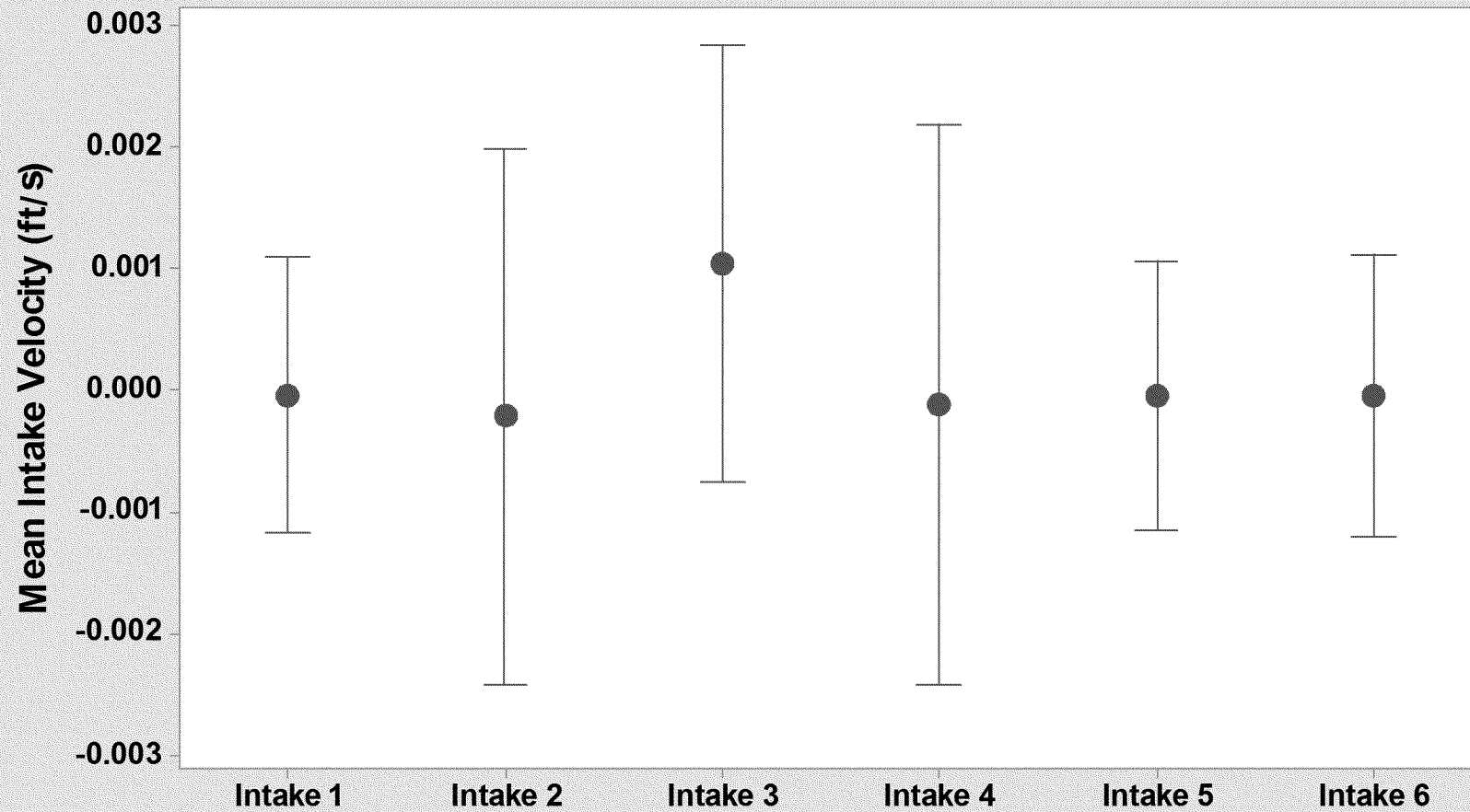


Figure 2: Individual Value Plot of Daily Changes in Intake Velocity

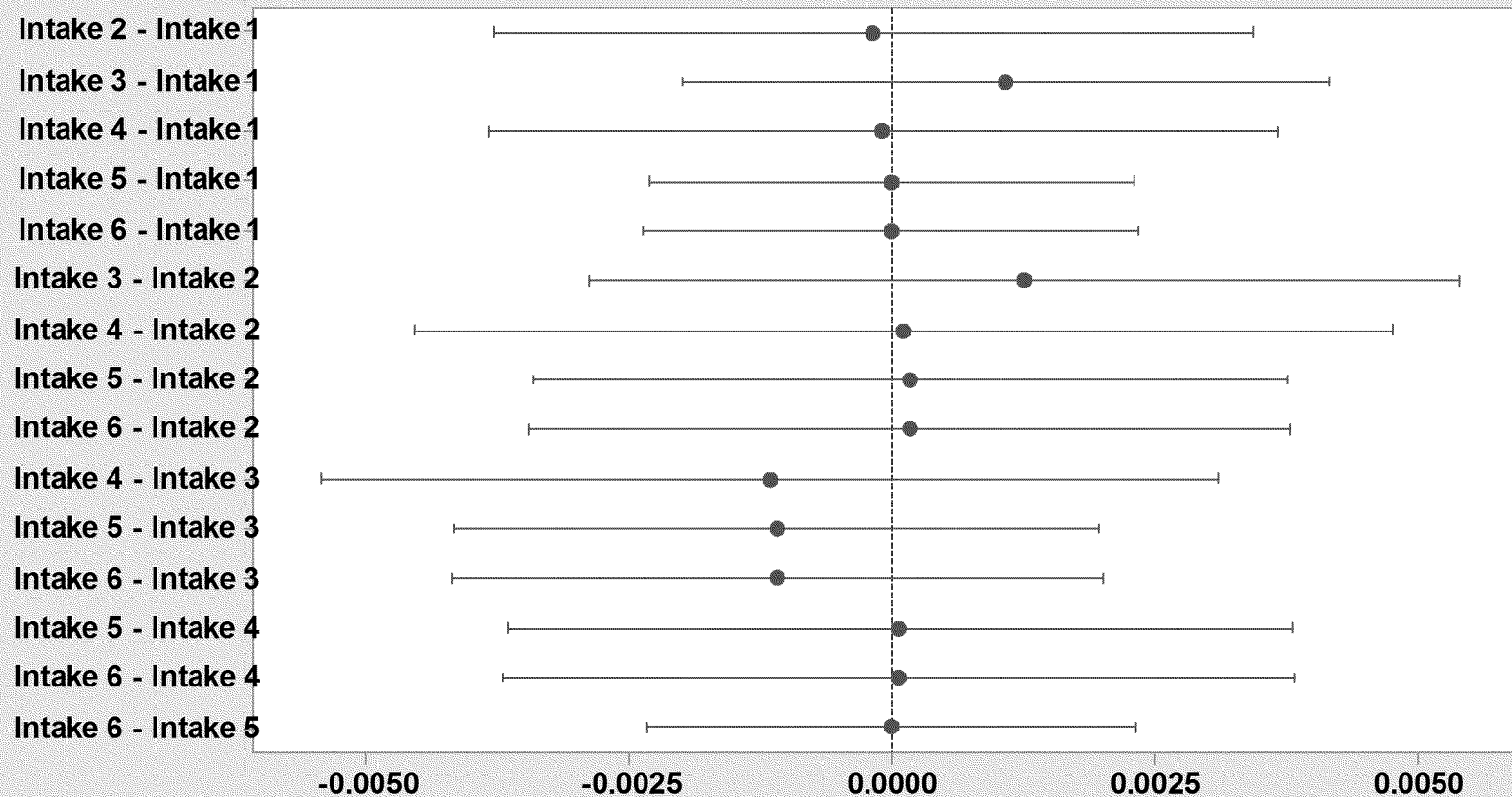


**Figure 3: Interval Plot of Intake 1, Intake 2, ...
95% CI for the Mean**



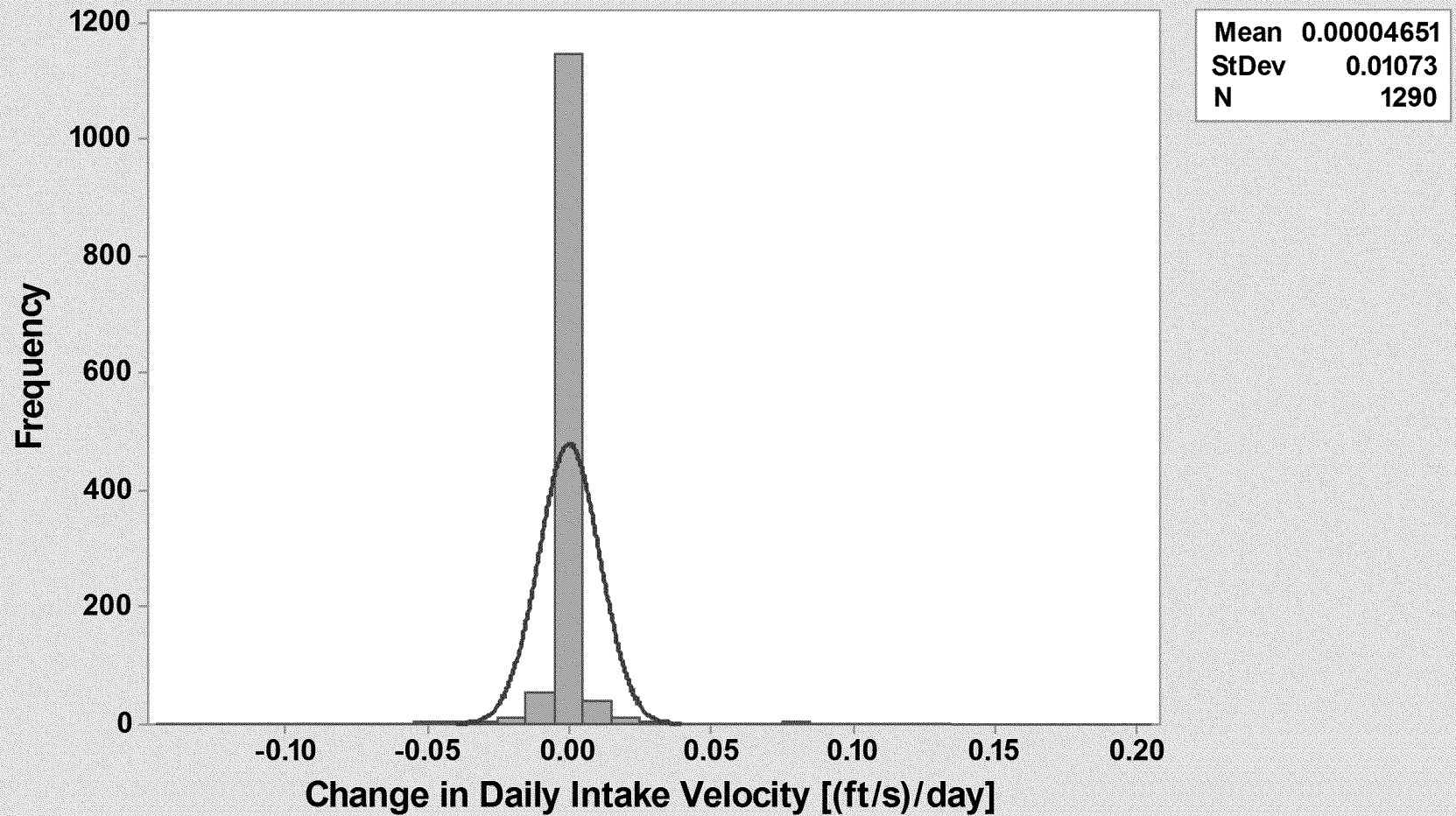
The pooled standard deviation is used to calculate the intervals.

**Figure 4: Tukey Simultaneous 95% CIs
Difference of Means for Intake 1, Intake 2, ...**



If an interval does not contain zero, the corresponding means are significantly different.

**Figure 5: Histogram of Combined Intake Velocity Data
Normal**



APPENDIX E

COMMENT NO. 37



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July 9, 2014

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Re: Second Quarter 2014 Entrainment Monitoring Report for the Chevron Jack and St.
Malo Floating Production Unit
CK Project No. 10726

Dear Ms. Dahl:

CK Associates (CK) is providing this letter report to Chevron USA (Chevron) to summarize the findings of the second quarter 2014 entrainment monitoring event for intake water collected from the cooling water intake structure (CWIS) aboard the Jack and St. Malo (JSM) floating production unit (FPU). The JSM FPU is a new fixed facility, for which construction was commenced after July 17, 2006. Therefore, quarterly entrainment monitoring is required for the JSM FPU CWIS in accordance with section 12.c.2.ii of the *NPDES General Permit for New and Existing Sources and New Dischargers in the Offshore Subcategory of the Oil and Gas Extraction Point Source Category for the Western Portion of the Outer Continental Shelf of the Gulf of Mexico (GMG290000)* (general permit).

Sample Collection

Entrainment samples were collected by Chevron personnel from a slip stream of the cooling water system. The slip stream begins downstream of the CWIS intake screens and upstream of the facility heat exchanger(s). The slip stream is passed through an entrainment monitoring device (EMD) consisting of a closed conduit with a 330 micrometer screen in line with the flow after which the stream is returned to the JSM cooling water system downstream of the facility heat exchanger(s).

The sampling process began at 14:15 on June 27, 2014 and lasted until 14:15 on June 28, 2014. The EMD was operated continuously during the sampling period at a flow rate of 13.2 gallons per minute resulting in an entrainment sample volume of 19,000 gallons. Sample collection data are summarized in Table 1. Upon sampling termination, the screen was removed from the EMD and washed of entrained particles into sample jars containing 10% buffered formalin. The sample jars were packed in an ice chest and shipped to CK for processing and species identification by a fisheries biologist.

Sample Results

Samples were analyzed for the presence of eggs and larvae from yellowfin tuna, and red snapper. These species were identified in the FPU's general permit application as representative commercial and recreational species of concern because eggs and larvae of these species are considered to be most likely to be entrained in the JSM CWIS.

Zero yellowfin tuna eggs/larvae and zero red snapper eggs/larvae were identified during sample analysis. When normalized to the total facility flow, this entrainment rate accounts to zero eggs/larvae per cubic meter and approximately zero species of concern entrained per day. A summary of the entrained species of concern is included in Table 2. Entrained organisms that were not listed as species of concern, but that were found in the entrainment samples included copepods, decapods, chaetognatha, and various phytoplankton. These organisms should not be included as part of the discharge monitoring report submittal because they do not represent species of commercial, recreational, or forage concern.

Conclusions

Based on the analysis of the entrainment monitoring samples, engineering controls installed at the JSM FPU CWIS have successfully minimized the potential for environmental damage due to entrainment in the facility CWIS.

If you have any questions or comments regarding this report, please do not hesitate to contact me at (255) 755-1000 or via email at Chad.Cristina@C-KA.com.

Sincerely yours,
CK Associates

A handwritten signature in cursive script, appearing to read "Chad Cristina", followed by the printed text "Ph.D., P.E.".

Chad M. Cristina Ph.D., P.E.
Senior Environmental Engineer

Attachments: As referenced

Table 1
Sample Collection Data Summary by Quarter

Quarter	Year	Start Date and Time	Stop Date and Time	Flow Rate (gal/min)	Sample Volume (MG)	Collection Method
2	2014	6/27/2014 14:15	6/28/2014 14:25	13.2	0.019	24-hr Continuous

Table 2
Entrainment Summary by Quarter

Quarter	Year	Species/Family	Total Collected	Sample Volume (MG)	Total # Entrained ¹
2	2014	<i>Thunnus albacares</i> (yellowfin tuna)	0	0.019	0
2	2014	<i>Lutjanus campechanus</i> (red snapper)	0	0.019	0
2	2014	Total	0	0.019	0

¹ Projected number of organisms entrained per quarter based on an average cooling water flow equal to 26.8 MGD for a 91-day quarter



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September 18, 2014

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LAKE CHARLES, LA
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SHREVEPORT, LA
PHONE (318) 797-8636
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**Re: Third Quarter 2014 Entrainment Monitoring Report for the Chevron Jack and St. Malo
Floating Production Unit
CK Project No. 10726**

Dear Ms. Dahl:

CK Associates (CK) is providing this letter report to Chevron USA (Chevron) to summarize the findings of the third quarter 2014 entrainment monitoring event for intake water collected from the cooling water intake structure (CWIS) aboard the Jack and St. Malo (JSM) floating production unit (FPU). The JSM FPU is a new fixed facility, for which construction was commenced after July 17, 2006. Therefore, quarterly entrainment monitoring is required for the JSM FPU CWIS in accordance with section 12.c.2.ii of the *NPDES General Permit for New and Existing Sources and New Dischargers in the Offshore Subcategory of the Oil and Gas Extraction Point Source Category for the Western Portion of the Outer Continental Shelf of the Gulf of Mexico (GMG290000)* (general permit).

Sample Collection

Entrainment samples were collected by Chevron personnel from a slip stream of the cooling water system. The slip stream begins downstream of the CWIS intake screens and upstream of the facility heat exchanger(s). The slip stream is passed through an entrainment monitoring device (EMD) consisting of a closed conduit with a 330 micrometer screen in line with the flow after which the stream is returned to the JSM cooling water system downstream of the facility heat exchanger(s).

The sampling process began at 03:00 on August 4, 2014 and lasted until 03:00 on August 5, 2014. The EMD was operated continuously during the sampling period at a flow rate of 13.2 gallons per minute resulting in an entrainment sample volume of 19,000 gallons. Sample collection data are summarized in Table 1. Upon sampling termination, the screen was removed from the EMD and washed of entrained particles into sample jars containing 10% buffered formalin. The sample jars were packed in an ice chest and shipped to CK for processing and species identification by a fisheries biologist.

Sample Results

Samples were analyzed for the presence of eggs and larvae from yellowfin tuna, and red snapper. These species were identified in the FPU's general permit application as representative commercial and recreational species of concern because eggs and larvae of these species are considered to be most likely to be entrained in the JSM CWIS.

Zero yellowfin tuna eggs/larvae and zero red snapper eggs/larvae were identified during sample analysis. When normalized to the total facility flow, this entrainment rate accounts to zero eggs/larvae per cubic meter and approximately zero species of concern entrained per day. A summary of the entrained species of concern is included in Table 2. Entrained organisms that were not listed as species of concern, but that were found in the entrainment samples included copepods, decapods, chaetognatha, and various phytoplankton. These organisms should not be included as part of the discharge monitoring report submittal because they do not represent species of commercial, recreational, or forage concern.

Conclusions

Based on the analysis of the entrainment monitoring samples, engineering controls installed at the JSM FPU CWIS have successfully minimized the potential for environmental damage due to entrainment in the facility CWIS.

If you have any questions or comments regarding this report, please do not hesitate to contact me at (255) 755-1000 or via email at Chad.Cristina@C-KA.com.

Sincerely yours,
CK Associates



Chad M. Cristina Ph.D., P.E.
Senior Environmental Engineer

Attachments: As referenced

Table 1
Sample Collection Data Summary by Quarter

Quarter	Year	Start Date and Time	Stop Date and Time	Flow Rate (gal/min)	Sample Volume (MG)	Collection Method
3	2014	8/4/2014 03:00	8/5/2014 03:00	13.2	0.019	24-hr Continuous

Table 2
Entrainment Summary by Quarter

Quarter	Year	Species/Family	Total Collected	Sample Volume (MG)	Total # Entrained ¹
3	2014	<i>Thunnus albacares</i> (yellowfin tuna)	0	0.019	0
3	2014	<i>Lutjanus campechanus</i> (red snapper)	0	0.019	0
3	2014	Total	0	0.019	0

¹ Projected number of organisms entrained per quarter based on an average cooling water flow equal to 26.8 MGD for a 91-day quarter.



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December 29, 2014

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SHREVEPORT, LA
PHONE (318) 797-8636
FAX (318) 798-0478

**Re: Fourth Quarter 2014 Entrainment Monitoring Report for the Chevron Jack and St. Malo Floating Production Unit
CK Project No. 10726**

Dear Ms. Dahl:

CK Associates (CK) is providing this letter report to Chevron USA (Chevron) to summarize the findings of the fourth quarter 2014 entrainment monitoring event for intake water collected from the cooling water intake structure (CWIS) aboard the Jack and St. Malo (JSM) floating production unit (FPU). The JSM FPU is a new fixed facility, for which construction was commenced after July 17, 2006. Therefore, quarterly entrainment monitoring is required for the JSM FPU CWIS in accordance with section 12.c.2.ii of the *NPDES General Permit for New and Existing Sources and New Dischargers in the Offshore Subcategory of the Oil and Gas Extraction Point Source Category for the Western Portion of the Outer Continental Shelf of the Gulf of Mexico (GMG290000)* (general permit).

Sample Collection

Entrainment samples were collected by Chevron personnel from a slip stream of the cooling water system. The slip stream begins downstream of the CWIS intake screens and upstream of the facility heat exchanger(s). The slip stream is passed through an entrainment monitoring device (EMD) consisting of a closed conduit with a 330 micrometer screen in line with the flow after which the stream is returned to the JSM cooling water system downstream of the facility heat exchanger(s).

The sampling process began at 03:00 on August 4, 2014 and lasted until 03:00 on August 5, 2014. The EMD was operated continuously during the sampling period at a flow rate of 13 gallons per minute resulting in an entrainment sample volume of 19,000 gallons. Sample collection data are summarized in Table 1. Upon sampling termination, the screen was removed from the EMD and washed of entrained particles into sample jars containing 10% buffered formalin. The sample jars were packed in an ice chest and shipped to CK for processing and species identification by a fisheries biologist.

Sample Results

Samples were analyzed for the presence of eggs and larvae from yellowfin tuna, and red snapper. These species were identified in the FPU's general permit application as representative commercial and recreational species of concern because eggs and larvae of these species are considered to be most likely to be entrained in the JSM CWIS.

Zero yellowfin tuna eggs/larvae and zero red snapper eggs/larvae were identified during sample analysis. When normalized to the total facility flow, this entrainment rate amounts to zero eggs/larvae per cubic meter and zero species of concern entrained per day. A summary of the entrained species of concern is included in Table 2. Entrained organisms that were not listed as species of concern, but that were found in the entrainment samples included polychaets, pteropods, copepods, chaetognaths, amphipods, and five fish species. None of these organisms should not be included as part of the discharge monitoring report submittal because they do not represent species of commercial, recreational, or forage concern.

Conclusions

Zero organisms of commercial, recreational, or forage concern were identified in entrainment samples collected from the JSM FPU during its first three calendar quarters of entrainment monitoring. Based on the analysis of the entrainment monitoring samples, engineering controls installed at the JSM FPU CWIS have successfully minimized the potential for environmental damage due to entrainment in the facility CWIS.

If you have any questions or comments regarding this report, please do not hesitate to contact me at (255) 755-1000 or via email at Chad.Cristina@C-KA.com.

Sincerely yours,
CK Associates

A handwritten signature in cursive script, reading "Chad Cristina Ph.D., P.E.", written in dark ink.

Chad M. Cristina Ph.D., P.E.
Senior Environmental Engineer

Attachments: As referenced

Table 1
Sample Collection Data Summary by Quarter

Quarter	Year	Start Date and Time	Stop Date and Time	Flow Rate (gal/min)	Sample Volume (MG)	Collection Method
4	2014	11/24/2014 0300	11/25/2014 0300	13.2 (est)	0.019	24-hr Continuous

Table 2
Entrainment Summary by Quarter

Quarter	Year	Species/Family	Total Collected	Sample Volume (MG)	Total # Entrained ¹
2	2014	<i>Thunnus albacares</i> (yellowfin tuna)	0	0.019	0
2	2014	<i>Lutjanus campechanus</i> (red snapper)	0	0.019	0
3	2014	<i>Thunnus albacares</i> (yellowfin tuna)	0	0.019	0
3	2014	<i>Lutjanus campechanus</i> (red snapper)	0	0.019	0
4	2014	<i>Thunnus albacares</i> (yellowfin tuna)	0	0.019	0
4	2014	<i>Lutjanus campechanus</i> (red snapper)	0	0.019	0
Total	2014	<i>Thunnus albacares</i> (yellowfin tuna)	0		0
Total	2014	<i>Lutjanus campechanus</i>(red snapper)	0		0

¹ Projected number of organisms entrained per quarter based on an average cooling water flow equal to 26.8 MGD for a 91-day quarter.



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July 23, 2015

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FAX (318) 798-0478

**Re: Revised First Quarter 2015 Entrainment Monitoring Report for the Chevron Jack and St. Malo Floating Production Unit
CK Project No. 10726**

Dear Ms. Dahl:

CK Associates (CK) is providing this letter report to Chevron USA (Chevron) to summarize the findings of the first quarter 2015 entrainment monitoring event for intake water collected from the cooling water intake structure (CWIS) aboard the Jack and St. Malo (JSM) floating production unit (FPU). The JSM FPU is a new fixed facility, for which construction was commenced after July 17, 2006. Therefore, quarterly entrainment monitoring is required for the JSM FPU CWIS in accordance with section 12.c.2.ii of the *NPDES General Permit for New and Existing Sources and New Dischargers in the Offshore Subcategory of the Oil and Gas Extraction Point Source Category for the Western Portion of the Outer Continental Shelf of the Gulf of Mexico (GMG290000)* (general permit).

Sample Collection

Entrainment samples were collected by Chevron personnel from a slip stream of the cooling water system. The slip stream begins downstream of the CWIS intake screens and upstream of the facility heat exchanger(s). The slip stream is passed through an entrainment monitoring device (EMD) consisting of a closed conduit with a 330 micrometer screen in line with the flow after which the stream is returned to the JSM cooling water system downstream of the facility heat exchanger(s).

The sampling process began at 15:00 on January 18, 2015 and lasted until 11:00 on January 19, 2015. The EMD was operated continuously during the sampling period at a flow rate of 13.2 gallons per minute resulting in an entrainment sample volume of 16,000 gallons. Sample collection data are summarized in Table 1. Upon sampling termination, the screen was removed from the EMD and washed of entrained particles into sample jars containing 10% buffered formalin. The sample jars were packed in an ice chest and shipped to CK for processing and species identification by a fisheries biologist.

Sample Results

Samples were analyzed for the presence of eggs and larvae from yellowfin tuna, and red snapper. These species were identified in the FPU's general permit application as representative commercial and recreational species of concern because eggs and larvae of these species are considered to be most likely to be entrained in the JSM CWIS.

Zero yellowfin tuna eggs/larvae and zero red snapper eggs/larvae were identified during sample analysis. When normalized to the total facility flow, this entrainment rate amounts to zero eggs/larvae per cubic meter and zero species of concern entrained per day. A summary of the entrained species of concern is included in Table 2. Entrained organisms that were not listed as species of concern, but that were found in the entrainment samples included polychaets, pteropods, copepods, chaetognaths, amphipods, ctenophores and two fish species. None of these organisms should be included as part of the discharge monitoring report submittal because they do not represent species of commercial, recreational, or forage concern.

Conclusions

Zero organisms of commercial, recreational, or forage concern were identified in entrainment samples collected from the JSM FPU during its first calendar quarter of entrainment monitoring. Based on the analysis of the entrainment monitoring samples, engineering controls installed at the JSM FPU CWIS have successfully minimized the potential for environmental damage due to entrainment in the facility CWIS.

If you have any questions or comments regarding this report, please do not hesitate to contact me at (255) 755-1000 or via email at Chad.Cristina@C-KA.com.

Sincerely yours,
CK Associates

Handwritten signature of Chad M. Cristina in cursive, followed by the text "Ph.D., P.E.".

Chad M. Cristina Ph.D., P.E.
Senior Environmental Engineer

Attachments: As referenced

Table 1
Sample Collection Data Summary by Quarter

Quarter	Year	Start Date and Time	Stop Date and Time	Flow Rate (gal/min)	Sample Volume (MG)	Collection Method
1	2015	1/18/2015 1500	1/19/2015 1100	13.2 (est)	0.016	Composite

Table 2
Entrainment Summary by Quarter

Quarter	Year	Species/Family	Total Collected	Sample Volume (MG)	Total # Entrained ¹
1	2015	<i>Thunnus albacares</i> (yellowfin tuna)	0	0.016	0
1	2015	<i>Lutjanus campechanus</i> (red snapper)	0	0.016	0
Total	2014	<i>Thunnus albacares</i> (yellowfin tuna)	0		0
Total	2014	<i>Lutjanus campechanus</i> (red snapper)	0		0

¹ Projected number of organisms entrained per quarter based on an average cooling water flow equal to 26.1 MGD for a 91-day quarter.



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July 23, 2015

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Attn: Jim Floyd

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LAKE CHARLES, LA
PHONE (337) 625-6577
FAX (337) 625-6580

SHREVEPORT, LA
PHONE (318) 797-8636
FAX (318) 798-0478

**Re: Revised Second Quarter 2015 Entrainment Monitoring Report for the Chevron Jack and St. Malo Floating Production Unit
CK Project No. 10726**

Dear Ms. Dahl:

CK Associates (CK) is providing this letter report to Chevron USA (Chevron) to summarize the findings of the second quarter 2015 entrainment monitoring event for intake water collected from the cooling water intake structure (CWIS) aboard the Jack and St. Malo (JSM) floating production unit (FPU). The JSM FPU is a new fixed facility, for which construction was commenced after July 17, 2006. Therefore, quarterly entrainment monitoring is required for the JSM FPU CWIS in accordance with section 12.c.2.ii of the *NPDES General Permit for New and Existing Sources and New Dischargers in the Offshore Subcategory of the Oil and Gas Extraction Point Source Category for the Western Portion of the Outer Continental Shelf of the Gulf of Mexico (GMG290000)* (general permit).

Sample Collection

Entrainment samples were collected by Chevron personnel from a slip stream of the cooling water system. The slip stream begins downstream of the CWIS intake screens and upstream of the facility heat exchanger(s). The slip stream is passed through an entrainment monitoring device (EMD) consisting of a closed conduit with a 330 micrometer screen in line with the flow after which the stream is returned to the JSM cooling water system downstream of the facility heat exchanger(s).

The sampling process began at 03:00 on April 6, 2015 and lasted until 21:00 that evening. The EMD was operated continuously during the sampling period at a flow rate of 13.2 gallons per minute resulting in an entrainment sample volume of 16,000 gallons. Sample collection data are summarized in Table 1. Upon sampling termination, the screen was removed from the EMD and washed of entrained particles into sample jars containing 10% buffered formalin. The sample jars were packed in an ice chest and shipped to CK for processing and species identification by a fisheries biologist.

Sample Results

Samples were analyzed for the presence of eggs and larvae from yellowfin tuna, and red snapper. These species were identified in the FPU's general permit application as representative commercial and recreational species of concern because eggs and larvae of these species are considered to be most likely to be entrained in the JSM CWIS.

Zero yellowfin tuna eggs/larvae and zero red snapper eggs/larvae were identified during sample analysis. When normalized to the total facility flow, this entrainment rate amounts to zero eggs/larvae per cubic meter and zero species of concern entrained per day. A summary of the entrained species of concern is included in Table 2. Entrained organisms that were not listed as species of concern, but that were found in the entrainment samples included copepods, pteropods, amphipods, chaetognaths, ctenophores. Additionally, one damaged fish larva was observed, although the species was unable to be identified. None of these organisms should be included as part of the discharge monitoring report submittal because they do not represent species of commercial, recreational, or forage concern.

Conclusions

Zero organisms of commercial, recreational, or forage concern were identified in entrainment samples collected from the JSM FPU during its first calendar quarter of entrainment monitoring. Based on the analysis of the entrainment monitoring samples, engineering controls installed at the JSM FPU CWIS have successfully minimized the potential for environmental damage due to entrainment in the facility CWIS.

If you have any questions or comments regarding this report, please do not hesitate to contact me at (255) 755-1000 or via email at Chad.Cristina@C-KA.com.

Sincerely yours,
CK Associates

Handwritten signature of Chad M. Cristina in cursive, followed by the text "Ph.D., P.E.".

Chad M. Cristina Ph.D., P.E.
Senior Environmental Engineer

Attachments: As referenced

Table 1
Sample Collection Data Summary by Quarter

Quarter	Year	Start Date and Time	Stop Date and Time	Flow Rate (gal/min)	Sample Volume (MG)	Collection Method
2	2015	4/6/15 0300	4/6/15 2100	13.2 (est)	0.016	Composite

Table 2
Entrainment Summary by Quarter

Quarter	Year	Species/Family	Total Collected	Sample Volume (MG)	Total # Entrained ¹
1	2015	<i>Thunnus albacares</i> (yellowfin tuna)	0	0.016	0
1	2015	<i>Lutjanus campechanus</i> (red snapper)	0	0.016	0
2	2015	<i>Thunnus albacares</i> (yellowfin tuna)	0	0.016	0
2	2015	<i>Lutjanus campechanus</i> (red snapper)	0	0.016	0
Total	2015	<i>Thunnus albacares</i> (yellowfin tuna)	0	N/A	0
Total	2015	<i>Lutjanus campechanus</i> (red snapper)	0	N/A	0

¹ Projected number of organisms entrained per quarter based on an average cooling water flow equal to 26.5 MGD for a 91-day quarter.



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July 23, 2015

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**Re: Third Quarter 2015 Entrainment Monitoring Report for the Chevron Jack and St. Malo
Floating Production Unit
CK Project No. 10726**

Dear Mr. Floyd:

CK Associates (CK) is providing this letter report to Chevron USA (Chevron) to summarize the findings of the third quarter 2015 entrainment monitoring event for intake water collected from the cooling water intake structure (CWIS) aboard the Jack and St. Malo (JSM) floating production unit (FPU). The JSM FPU is a new fixed facility, for which construction was commenced after July 17, 2006. Therefore, quarterly entrainment monitoring is required for the JSM FPU CWIS in accordance with section 12.c.2.ii of the *NPDES General Permit for New and Existing Sources and New Dischargers in the Offshore Subcategory of the Oil and Gas Extraction Point Source Category for the Western Portion of the Outer Continental Shelf of the Gulf of Mexico (GMG290000)* (general permit), effective October 1, 2012.

Sample Collection

Entrainment samples were collected by Chevron personnel from a slip stream of the cooling water system. The slip stream begins downstream of the CWIS intake screens and upstream of the facility heat exchanger(s). The slip stream is passed through an entrainment monitoring device (EMD) consisting of a closed conduit with a 330 micrometer screen in line with the flow after which the stream is returned to the JSM cooling water system downstream of the facility heat exchanger(s).

The sampling process began at 13:00 on July 4, 2015 and lasted until 07:00 July 5, 2015. The EMD was operated continuously during the sampling period at a flow rate of 11.0 gallons per minute resulting in an entrainment sample volume of 12,000 gallons. Sample collection data are summarized in Table 1. Upon sampling termination, the screen was removed from the EMD and washed of entrained particles into sample jars containing 10% buffered formalin. The sample jars were packed in an ice chest and shipped to CK for processing and species identification by a fisheries biologist. See attachments A and B for a copy of the field data sheet and chain of custody documentation respectively.

Sample Results

Samples were analyzed for the presence of eggs and larvae from yellowfin tuna, and red snapper. These species were identified in the FPU's general permit application as representative commercial and recreational species of concern because eggs and larvae of these species are considered to be most likely to be entrained in the JSM CWIS.

Zero yellowfin tuna eggs/larvae and zero red snapper eggs/larvae were identified during sample analysis. When normalized to the total facility flow, this entrainment rate amounts to zero eggs/larvae per cubic meter and zero species of concern entrained per day. A summary of the entrained species of concern is included in Table 2. Entrained organisms that were not listed as species of concern, but that were found in the entrainment samples included chaetognatha, copepods, amphipods, *Lucifer faxoni*. Additionally, three scaridae larvae was observed, although the species was unable to be identified. None of these organisms should be included as part of the discharge monitoring report submittal because they do not represent important commercial and recreational species of concern.

Conclusions

Zero organisms of important commercial and recreational species of concern were identified in entrainment samples collected from the JSM FPU during its third calendar quarter of entrainment monitoring. Based on the analysis of the entrainment monitoring samples, engineering controls installed at the JSM FPU CWIS have successfully minimized the potential for environmental, socioeconomic, and ecological damage due to entrainment in the facility CWIS.

If you have any questions or comments regarding this report, please do not hesitate to contact me at (255) 755-1000 or via email at James.Durbin@c-ka.com.

Sincerely yours,
CK Associates



James L. Durbin
Senior Environmental Scientist

Attachments: As referenced

Table 1
Sample Collection Data Summary by Quarter

Quarter	Year	Start Date and Time	Stop Date and Time	Flow Rate (gal/min)	Sample Volume (MG)	Collection Method
3	2015	7/4/15 1300	7/5/15 0700	11.0 (est)	0.012	Composite

Table 2
Entrainment Summary by Quarter

Quarter	Year	Species/Family	Total Collected	Sample Volume (MG)	Total # Entrained ¹
1	2015	<i>Thunnus albacares</i> (yellowfin tuna)	0	0.016	0
1	2015	<i>Lutjanus campechanus</i> (red snapper)	0	0.016	0
2	2015	<i>Thunnus albacares</i> (yellowfin tuna)	0	0.016	0
2	2015	<i>Lutjanus campechanus</i> (red snapper)	0	0.016	0
3	2015	<i>Thunnus albacares</i> (yellowfin tuna)	0	0.012	0
3	2015	<i>Lutjanus campechanus</i> (red snapper)	0	0.012	0
Total	2015	<i>Thunnus albacares</i> (yellowfin tuna)	0	N/A	0
Total	2015	<i>Lutjanus campechanus</i> (red snapper)	0	N/A	0

¹ Projected number of organisms entrained per quarter based on an average cooling water flow equal to 26.6 MGD for a 91-day quarter.

ATTACHMENT A
DATA SHEET FOR SAMPLE EVENT

Attachment A - Example Data Sheet
Cooling Water Intake Structure Entrainment Sampling and Monitoring Procedures
Chevron North America Exploration and Production Company Deepwater
Jack St. Malo Platform

Collection Date 7/4 - 7/5/15

Project Number _____

Names of Personnel Collecting Samples John Berry , Isaac Newman

Sample Collection Flow Rate 11 gal/min

Sample Event Start Time and Date 1 PM 7/4/15

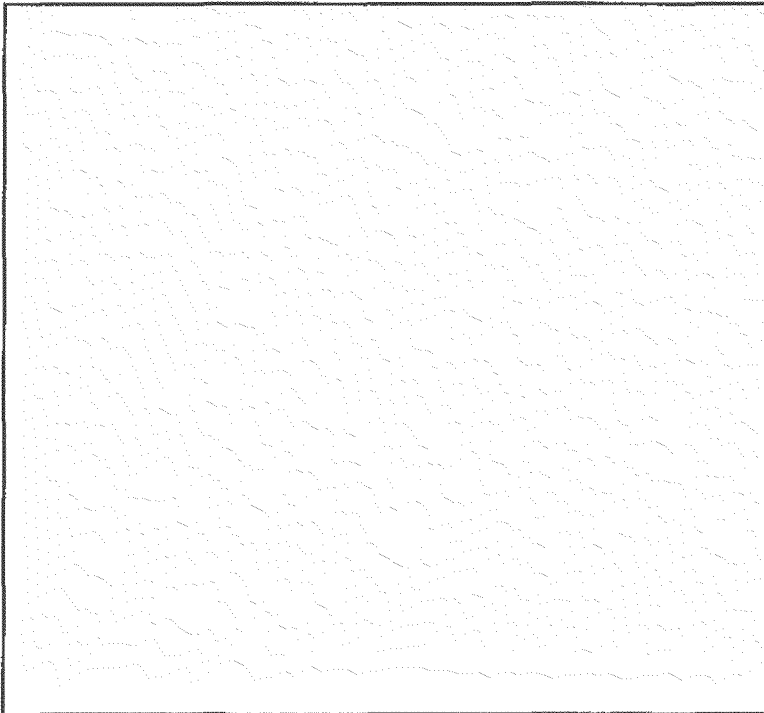
Sample Event End Time and Date 7 AM 7/5/15

Weather Conditions during each cycle Calm

Number of Sample Jars Filled 4

Sample Collection Method every 6 hours for 24 total hours

Other Notes Relevant to Sampling Event







ATTACHMENT B
CHAIN-OF-CUSTODY FOR SAMPLE EVENT

**CHAIN OF CUSTODY
AND
ANALYTICAL REQUEST RECORD**

Page ____ of ____

CLIENT: Chevron N.A. Jack St. Malo **P.O. NUMBER:** N/A **SAMPLED BY:** Isaac Newman
PROJECT NO.: _____ **LABORATORY*:** CK Associates **DATE:** 7/8/15

SAMPLE IDENTIFICATION	DATE	TIME	MATRIX	NO. OF CONTAINERS	PRESERVATIVE	ANALYSES AND INSTRUCTIONS
Sample #1	7/8/15	7/4/15 @ 1300	Sea-water	1 of 4	10% formalin	Provide information on species composition, abundance, and size of entrained organisms
Sample #2	7/8/15	7/4/15 @ 1400	Sea-water	2 of 4	10% formalin	
Sample #3	7/8/15	7/5/15 @ 0800	Sea-water	3 of 4	10% formalin	
Sample #4	7/8/15	7/5/15 @ 0700	Sea-water	4 of 4	10% formalin	
		↓				
		Dates and times written on containers				Lab ID JSM15070801 ^{CK2} 7-8-15
						Lab ID JSM15070801

Relinquished by:	(Name) <u>Clint Ward</u>	Date <u>7-8-15</u>	Time <u>8:00</u>	Received by:	(Name) <u>Kasten Despay</u>	Date <u>7/8/15</u>	Time <u>1047</u>
	(Signature) 	Date <u>7-8-15</u>	Time <u>8:00</u>		(Signature) 	Date <u>7/8/15</u>	Time <u>1047</u>
Relinquished by:	(Name) <u>Kasten Despay</u>	Date <u>7-8-15</u>	Time <u>11:18</u>	Received by Laboratory:	(Name) <u>Jenifer Thibault</u>	Date <u>7/8/15</u>	Time <u>11:18</u>
	(Signature) 	Date <u>7-8-15</u>	Time <u>11:18</u>		(Signature) 	Date <u>7/8/15</u>	Time <u>11:18</u>
Method of Shipment: <u>HotSpot</u>		Condition of Samples upon receipt at laboratory:				Temperature upon receipt	

Jennifer Thibault 7/8/15 13:58 Robert Waddell 7-8-15 1358
Please send results and invoice to the attention of _____ in our ☐ Baton Rouge, ☐ Lake Charles, ☐ Shreveport, ☐ Houston Office

ATTACHMENT C
FIELD OBSERVATIONS DURING SAMPLING

Subject: JSM Entrainment Sample-Attachment A

From: Rodrigue, Clay W. (wrod) [<mailto:WROD@chevron.com>]

Sent: Thursday, July 09, 2015 3:56 PM

To: Kunjappy, Raj

Subject: RE: JSM Entrainment Sample-Attachment A

Raj, Speaking with John Berry.

1. No obstructions in the meter or the hoses.
2. The assembly has no devices that require calibration, the flow meter is a replaceable type and is functioning now.
3. See above.
4. Both gentlemen report that the screen was intact during the collection procedure.
5. No incident or situation occurred that would draw any attention to the lowered count. Pumps stayed online with no shut-ins or swaps.

Both indicated a light coating of the material was noted. Let me know if you feel another sample is needed.

From: Kunjappy, Raj

Sent: Thursday, July 09, 2015 3:03 PM

To: Rodrigue, Clay W. (wrod)

Cc: Floyd, Jim

Subject: RE: JSM Entrainment Sample-Attachment A

If we can evaluate the sample procedure and ensure none of the following occurred:

- (1) possible flow meter obstruction due to aquatic vegetation or other debris on the propeller
- (2) malfunctioning or damaged flow meters;
- (3) any equipment used that requires calibration and is not properly calibrated;
- (4) damaged (torn) screening found after a sample is collected;
- (5) any incident or situation which may result in the collection of unreliable data;

I am leaning towards having the lab analyze if we can confirm the above.

Thank you,

Raj Kunjappy

HES Specialist- Water/NPDES

Gulf of Mexico Business Unit

Chevron North America Exploration and Production Company

(a Chevron U.S.A. Inc division)

100 Northpark Boulevard (COV114/122B)

Covington, LA 70433

O: 985-773-7283

C: 985-377-6991

raj.kunjappy@chevron.com

From: Rodrigue, Clay W. (wrod)

Sent: Thursday, July 09, 2015 2:50 PM

To: Kunjappy, Raj

Subject: RE: JSM Entrainment Sample-Attachment A

Raj, I just spoke with Isaac and he commented that he noticed little was caught in the sample he recovered. Also spoke with John separately and he noted the same. Neither felt the necessity to include it in the note section, though they both said it was just out of the ordinary.

From: Kunjappy, Raj

Sent: Thursday, July 09, 2015 2:05 PM

To: Rodrigue, Clay W. (wrod)

Subject: JSM Entrainment Sample-Attachment A

Clay,

Do you have a document referred to as "Attachment A" that was filled out? If you do, could you send it to me? See the second page of the attachment.

Thank you,

Raj Kunjappy

HES Specialist- Water/NPDES

Gulf of Mexico Business Unit

Chevron North America Exploration and Production Company

(a Chevron U.S.A. Inc division)

100 Northpark Boulevard (COV114/122B)

Covington, LA 70433

O: 985-773-7283

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raj.kunjappy@chevron.com



17170 PERKINS ROAD
BATON ROUGE, LA 70810
PHONE (225) 755-1000
FAX (225) 751-2010
<http://www.c-ka.com>

July 23, 2015

Sent Via Email

Chevron USA
100 Northpark Blvd.
Houston, TX 70433
Attn: Jim Floyd

HOUSTON, TX
PHONE (281) 397-9016
FAX (281) 397-6637

LAKE CHARLES, LA
PHONE (337) 625-6577
FAX (337) 625-6580

SHREVEPORT, LA
PHONE (318) 797-8636
FAX (318) 798-0478

**Re: Third Quarter 2015 Entrainment Monitoring Report for the Chevron Jack and St. Malo
Floating Production Unit
CK Project No. 10726**

Dear Mr. Floyd:

CK Associates (CK) is providing this letter report to Chevron USA (Chevron) to summarize the findings of the third quarter 2015 entrainment monitoring event for intake water collected from the cooling water intake structure (CWIS) aboard the Jack and St. Malo (JSM) floating production unit (FPU). The JSM FPU is a new fixed facility, for which construction was commenced after July 17, 2006. Therefore, quarterly entrainment monitoring is required for the JSM FPU CWIS in accordance with section 12.c.2.ii of the *NPDES General Permit for New and Existing Sources and New Dischargers in the Offshore Subcategory of the Oil and Gas Extraction Point Source Category for the Western Portion of the Outer Continental Shelf of the Gulf of Mexico (GMG290000)* (general permit), effective October 1, 2012.

Sample Collection

Entrainment samples were collected by Chevron personnel from a slip stream of the cooling water system. The slip stream begins downstream of the CWIS intake screens and upstream of the facility heat exchanger(s). The slip stream is passed through an entrainment monitoring device (EMD) consisting of a closed conduit with a 330 micrometer screen in line with the flow after which the stream is returned to the JSM cooling water system downstream of the facility heat exchanger(s).

The sampling process began at 13:00 on July 4, 2015 and lasted until 07:00 July 5, 2015. The EMD was operated continuously during the sampling period at a flow rate of 11.0 gallons per minute resulting in an entrainment sample volume of 12,000 gallons. Sample collection data are summarized in Table 1. Upon sampling termination, the screen was removed from the EMD and washed of entrained particles into sample jars containing 10% buffered formalin. The sample jars were packed in an ice chest and shipped to CK for processing and species identification by a fisheries biologist. See attachments A and B for a copy of the field data sheet and chain of custody documentation respectively.

Sample Results

Samples were analyzed for the presence of eggs and larvae from yellowfin tuna, and red snapper. These species were identified in the FPU's general permit application as representative commercial and recreational species of concern because eggs and larvae of these species are considered to be most likely to be entrained in the JSM CWIS.

Zero yellowfin tuna eggs/larvae and zero red snapper eggs/larvae were identified during sample analysis. When normalized to the total facility flow, this entrainment rate amounts to zero eggs/larvae per cubic meter and zero species of concern entrained per day. A summary of the entrained species of concern is included in Table 2. Entrained organisms that were not listed as species of concern, but that were found in the entrainment samples included chaetognatha, copepods, amphipods, *Lucifer faxoni*. Additionally, three scaridae larvae was observed, although the species was unable to be identified. None of these organisms should be included as part of the discharge monitoring report submittal because they do not represent important commercial and recreational species of concern.

Conclusions

Zero organisms of important commercial and recreational species of concern were identified in entrainment samples collected from the JSM FPU during its third calendar quarter of entrainment monitoring. Based on the analysis of the entrainment monitoring samples, engineering controls installed at the JSM FPU CWIS have successfully minimized the potential for environmental, socioeconomic, and ecological damage due to entrainment in the facility CWIS.

If you have any questions or comments regarding this report, please do not hesitate to contact me at (255) 755-1000 or via email at James.Durbin@c-ka.com.

Sincerely yours,
CK Associates



James L. Durbin
Senior Environmental Scientist

Attachments: As referenced

Table 1
Sample Collection Data Summary by Quarter

Quarter	Year	Start Date and Time	Stop Date and Time	Flow Rate (gal/min)	Sample Volume (MG)	Collection Method
3	2015	7/4/15 1300	7/5/15 0700	11.0 (est)	0.012	Composite

Table 2
Entrainment Summary by Quarter

Quarter	Year	Species/Family	Total Collected	Sample Volume (MG)	Total # Entrained ¹
1	2015	<i>Thunnus albacares</i> (yellowfin tuna)	0	0.016	0
1	2015	<i>Lutjanus campechanus</i> (red snapper)	0	0.016	0
2	2015	<i>Thunnus albacares</i> (yellowfin tuna)	0	0.016	0
2	2015	<i>Lutjanus campechanus</i> (red snapper)	0	0.016	0
3	2015	<i>Thunnus albacares</i> (yellowfin tuna)	0	0.012	0
3	2015	<i>Lutjanus campechanus</i> (red snapper)	0	0.012	0
Total	2015	<i>Thunnus albacares</i> (yellowfin tuna)	0	N/A	0
Total	2015	<i>Lutjanus campechanus</i> (red snapper)	0	N/A	0

¹ Projected number of organisms entrained per quarter based on an average cooling water flow equal to 26.5 MGD for a 91-day quarter.

ATTACHMENT A
DATA SHEET FOR SAMPLE EVENT

Attachment A - Example Data Sheet
Cooling Water Intake Structure Entrainment Sampling and Monitoring Procedures
Chevron North America Exploration and Production Company Deepwater
Jack St. Malo Platform

Collection Date

7/4 - 7/5/15

Project Number

Names of Personnel Collecting
Samples

John Berry, Isaac Newman

Sample Collection Flow Rate

11 gal/min

Sample Event Start Time and Date

1 PM 7/4/15

Sample Event End Time and Date

7 AM 7/5/15

Weather Conditions during each
cycle

Calm

Number of Sample Jars Filled

4

Sample Collection Method

every 6 hours for 24 total hours

Other Notes Relevant to Sampling
Event

ATTACHMENT B
CHAIN-OF-CUSTODY FOR SAMPLE EVENT

**CHAIN OF CUSTODY
AND
ANALYTICAL REQUEST RECORD**

Page ____ of ____

CLIENT: Chevron N.A. Jack St. Mofo **P.O. NUMBER:** N/A **SAMPLED BY:** Isaac Newman
PROJECT NO.: _____ **LABORATORY*:** CK Associates **DATE:** 7/8/15

SAMPLE IDENTIFICATION	DATE	TIME	MATRIX	NO. OF CONTAINERS	PRESERVATIVE	ANALYSES AND INSTRUCTIONS
Sample #1	7/8/15	7/4/15 @ 1300	Sea-water	1 of 4	10% formain	Provide information on species composition, abundance, and size of entrained organisms
Sample #2	7/8/15	7/4/15 @ 1400	Sea-water	2 of 4	10% formain	
Sample #3	7/8/15	7/5/15 @ 0800	Sea-water	3 of 4	10% formain	
Sample #4	7/8/15	7/5/15 @ 0700	Sea-water	4 of 4	10% formain	
		↓				
		Dates and times written on sample containers				Lab ID JSM15070801 ^{CK2} 7-8-15
						Lab ID JSM15070801

Relinquished by:	(Name) <u>Clint Ward</u>	Date <u>7-8-15</u>	Time <u>8:00</u>	Received by:	(Name) <u>Kasten Despay</u>	Date <u>7/8/15</u>	Time <u>1047</u>
	(Signature) 	Date <u>7-8-15</u>	Time <u>8:00</u>		(Signature) 	Date <u>7/8/15</u>	Time <u>1047</u>
Relinquished by:	(Name) <u>Kasten Despay</u>	Date <u>7-8-15</u>	Time <u>11:18</u>	Received by Laboratory:	(Name) <u>Jenifer Thibault</u>	Date <u>7/8/15</u>	Time <u>11:18</u>
	(Signature) 	Date <u>7-8-15</u>	Time <u>11:18</u>		(Signature) 	Date <u>7/8/15</u>	Time <u>11:18</u>
Method of Shipment: <u>Hot Spot</u>		Condition of Samples upon receipt at laboratory:				Temperature upon receipt	

Jenifer Thibault 7/8/15 13:58 Robert Waddell 7-8-15 1358
Please send results and invoice to the attention of _____ in our ☐ Baton Rouge, ☐ Lake Charles, ☐ Shreveport, ☐ Houston Office

ATTACHMENT C
FIELD OBSERVATIONS DURING SAMPLING

Subject: JSM Entrainment Sample-Attachment A

From: Rodrigue, Clay W. (wrod) [<mailto:WROD@chevron.com>]

Sent: Thursday, July 09, 2015 3:56 PM

To: Kunjappy, Raj

Subject: RE: JSM Entrainment Sample-Attachment A

Raj, Speaking with John Berry.

1. No obstructions in the meter or the hoses.
2. The assembly has no devices that require calibration, the flow meter is a replaceable type and is functioning now.
3. See above.
4. Both gentlemen report that the screen was intact during the collection procedure.
5. No incident or situation occurred that would draw any attention to the lowered count. Pumps stayed online with no shut-ins or swaps.

Both indicated a light coating of the material was noted. Let me know if you feel another sample is needed.

From: Kunjappy, Raj

Sent: Thursday, July 09, 2015 3:03 PM

To: Rodrigue, Clay W. (wrod)

Cc: Floyd, Jim

Subject: RE: JSM Entrainment Sample-Attachment A

If we can evaluate the sample procedure and ensure none of the following occurred:

- (1) possible flow meter obstruction due to aquatic vegetation or other debris on the propeller
- (2) malfunctioning or damaged flow meters;
- (3) any equipment used that requires calibration and is not properly calibrated;
- (4) damaged (torn) screening found after a sample is collected;
- (5) any incident or situation which may result in the collection of unreliable data;

I am leaning towards having the lab analyze if we can confirm the above.

Thank you,

Raj Kunjappy

HES Specialist- Water/NPDES

Gulf of Mexico Business Unit

Chevron North America Exploration and Production Company

(a Chevron U.S.A. Inc division)

100 Northpark Boulevard (COV114/122B)

Covington, LA 70433

O: 985-773-7283

C: 985-377-6991

raj.kunjappy@chevron.com

From: Rodrigue, Clay W. (wrod)

Sent: Thursday, July 09, 2015 2:50 PM

To: Kunjappy, Raj
Subject: RE: JSM Entrainment Sample-Attachment A

Raj, I just spoke with Isaac and he commented that he noticed little was caught in the sample he recovered. Also spoke with John separately and he noted the same. Neither felt the necessity to include it in the note section, though they both said it was just out of the ordinary.

From: Kunjappy, Raj
Sent: Thursday, July 09, 2015 2:05 PM
To: Rodrigue, Clay W. (wrod)
Subject: JSM Entrainment Sample-Attachment A

Clay,
Do you have a document referred to as "Attachment A" that was filled out? If you do, could you send it to me? See the second page of the attachment.

Thank you,
Raj Kunjappy
HES Specialist- Water/NPDES

Gulf of Mexico Business Unit
Chevron North America Exploration and Production Company
(a Chevron U.S.A. Inc division)
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raj.kunjappy@chevron.com



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<http://www.c-ka.com>

October 30, 2015

Sent Via Email

Chevron USA
100 Northpark Blvd.
Houston, TX 70433
Attn: Jim Floyd

HOUSTON, TX
PHONE (281) 397-9016
FAX (281) 397-6637

LAKE CHARLES, LA
PHONE (337) 625-6577
FAX (337) 625-6580

SHREVEPORT, LA
PHONE (318) 797-8636
FAX (318) 798-0478

**Re: Fourth Quarter 2015 Entrainment Monitoring Report for the Chevron Jack and St. Malo Floating Production Unit
CK Project No. 10726**

Dear Mr. Floyd:

CK Associates (CK) is providing this letter report to Chevron USA (Chevron) to summarize the findings of the fourth quarter 2015 entrainment monitoring event for intake water collected from the cooling water intake structure (CWIS) aboard the Jack and St. Malo (JSM) floating production unit (FPU). The JSM FPU is a new fixed facility, for which construction was commenced after July 17, 2006. Therefore, quarterly entrainment monitoring is required for the JSM FPU CWIS in accordance with section 12.c.2.ii of the *NPDES General Permit for New and Existing Sources and New Dischargers in the Offshore Subcategory of the Oil and Gas Extraction Point Source Category for the Western Portion of the Outer Continental Shelf of the Gulf of Mexico (GMG290000)* (general permit), effective October 1, 2012.

Sample Collection

Entrainment samples were collected by Chevron personnel from a slip stream of the cooling water system. The slip stream begins downstream of the CWIS intake screens and upstream of the facility heat exchanger(s). The slip stream is passed through an entrainment monitoring device (EMD) consisting of a closed conduit with a 330 micrometer screen in line with the flow after which the stream is returned to the JSM cooling water system downstream of the facility heat exchanger(s).

The sampling process began at 19:00 on October 5, 2015 and lasted until 19:00 on October 6, 2015. The EMD was operated continuously during the sampling period at a flow rate of 19.0 gallons per minute resulting in an entrainment sample volume of 27,360 gallons. Sample collection data are summarized in Table 1. Upon sampling termination, the screen was removed from the EMD and washed of entrained particles into sample jars containing 10% buffered formalin. The sample jars were packed in an ice chest and shipped to CK for processing and species identification by a fisheries biologist. See attachments A and B for a copy of the field data sheet and chain of custody documentation respectively.

Sample Results

Samples were analyzed for the presence of eggs and larvae from yellowfin tuna, and red snapper. These species were identified in the FPU's general permit application as representative commercial and recreational species of concern because eggs and larvae of these species are considered to be most likely to be entrained in the JSM CWIS.

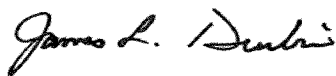
Zero yellowfin tuna eggs/larvae and zero red snapper eggs/larvae were identified during sample analysis. When normalized to the total facility flow, this entrainment rate amounts to zero eggs/larvae per cubic meter and zero species of concern entrained per day. A summary of the entrained species of concern is included in Table 2. Entrained organisms that were not listed as species of concern, but that were found in the entrainment samples included ctenophores, copepods, pteropods amphipods, *Lucifer faxoni*. Additionally, one Stomatopod (mantis shrimp) probably *Squilla empusa* stage II larvae, one Xanthidae crab probably *Hexapanopeus angustifrons* Megalop stage, two *Brevooitia spp.* larvae, and two Haemulidae larvae too damaged to identify. None of these organisms should be included as part of the discharge monitoring report submittal because they do not represent important commercial and recreational species of concern.

Conclusions

Zero organisms of important commercial and recreational species of concern were identified in entrainment samples collected from the JSM FPU during its fourth calendar quarter of entrainment monitoring. Based on the analysis of the entrainment monitoring samples, engineering controls installed at the JSM FPU CWIS have successfully minimized the potential for environmental, socioeconomic, and ecological damage due to entrainment in the facility CWIS.

If you have any questions or comments regarding this report, please do not hesitate to contact me at (255) 755-1000 or via email at James.Durbin@c-ka.com.

Sincerely yours,
CK Associates



James L. Durbin
Senior Environmental Scientist

Attachments: As referenced

Table 1
Sample Collection Data Summary by Quarter

Quarter	Year	Start Date and Time	Stop Date and Time	Flow Rate (gal/min)	Sample Volume (MG)	Collection Method
4	2015	10/5/15 1900	10/6/15 1900	19.0 (est)	0.027	Composite

Table 2
Entrainment Summary by Quarter

Quarter	Year	Species/Family	Total Collected	Sample Volume (MG)	Total # Entrained ¹
1	2015	<i>Thunnus albacares</i> (yellowfin tuna)	0	0.016	0
1	2015	<i>Lutjanus campechanus</i> (red snapper)	0	0.016	0
2	2015	<i>Thunnus albacares</i> (yellowfin tuna)	0	0.016	0
2	2015	<i>Lutjanus campechanus</i> (red snapper)	0	0.016	0
3	2015	<i>Thunnus albacares</i> (yellowfin tuna)	0	0.012	0
3	2015	<i>Lutjanus campechanus</i> (red snapper)	0	0.012	0
4	2015	<i>Thunnus albacares</i> (yellowfin tuna)	0	0.027	0
4	2015	<i>Lutjanus campechanus</i> (red snapper)	0	0.027	0
Total	2015	<i>Thunnus albacares</i> (yellowfin tuna)	0	N/A	0
Total	2015	<i>Lutjanus campechanus</i>(red snapper)	0	N/A	0

¹ Projected number of organisms entrained per quarter based on an average cooling water flow equal to 26.8 MGD for a 91-day quarter.

ATTACHMENT A
DATA SHEET FOR SAMPLE EVENT

Attachment A Data Sheet
Cooling Water Intake Structure Entrainment Sampling and Monitoring Procedures
Chevron North America Exploration and Production Company Deepwater
Jack St. Malo Platform

Collection Date 10/6/2015 7:00 AM, 1 PM, 7 PM
~~10/6/2015 7:00 AM, 1 PM, 7 PM~~

Project Number JSM

Names of Personnel Collecting Samples ISAAC NEWMAN / TOM BERRY

Sample Collection Flow Rate ≈ 16-19 GPM

Sample Event Start Time and Date 10/5/2015 7:00 PM

Sample Event End Time and Date 10/6/2015 7:00 PM

Weather Conditions during each cycle Calm; 4-5 ft seas;

Number of Sample Jars Filled 4

Sample Collection Method ENTRAINMENT MONITORING DEVICE

Other Notes Relevant to Sampling Event



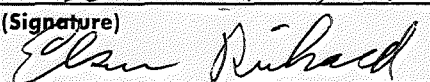
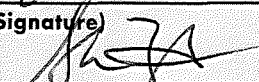
ATTACHMENT B
CHAIN-OF-CUSTODY FOR SAMPLE EVENT

CHAIN OF CUSTODY AND ANALYTICAL REQUEST RECORD

Page 1 of 1

CLIENT: <u>Chevron Jack St Malo</u>		P.O. NUMBER: <u>NA</u>		SAMPLED BY: <u>John Berry / ISAAC Newman</u>	
PROJECT NO.: <u>10726</u>		LABORATORY*: <u>CK Associates</u>		DATE: <u>10-6-15</u>	

SAMPLE IDENTIFICATION	DATE	TIME	MATRIX	NO. OF CONTAINERS	PRESERVATIVE	ANALYSES AND INSTRUCTIONS
Plankton	10-6-15	01:00	Sea Water	4	10% Formalin	Provide information on species composition abundance, and size of entrained organisms.
Plankton	10-6-15	07:00	Sea Water	4	10% Formalin	
Plankton	10-6-15	13:00	Sea Water	4	10% Formalin	
Plankton	10-6-15	19:00	Sea Water	4	10% Formalin	JSM 15100701

Relinquished by:	(Name) <u>TOTAL BERRY</u>	Date <u>10/7/15</u>	Time <u>13:08</u>	Received by:	(Name) <u>ELSON RICHARD</u>	Date <u>10-7-15</u>	Time <u>13:08</u>
	(Signature) 	Date ↓	Time ↓		(Signature) 	Date ↓	Time <u>1:08P</u>
Relinquished by:	(Name) <u>ELSON RICHARD</u>	Date <u>10-7-15</u>	Time <u>15:27</u>	Received by Laboratory:	(Name) <u>Guy Zieske</u>	Date <u>10.7.15</u>	Time <u>1527</u>
	(Signature) 	Date ↓	Time <u>3:27P</u>		(Signature) 	Date ↓	Time ↓
Method of Shipment:		Condition of Samples upon receipt at laboratory:				Temperature upon receipt	

Please send results and invoice to the attention of _____ in our ☐ Baton Rouge, ☐ Lake Charles, ☐ Shreveport, ☐ Houston Office

WHITE COPY TO ACCOMPANY SAMPLE • RETAIN YELLOW COPY FOR FILES • RETAIN PINK COPY FOR FIELD SUPERVISOR

CK-100



17170 PERKINS ROAD
BATON ROUGE, LA 70810
PHONE (225) 755-1000
FAX (225) 751-2010
<http://www.c-ka.com>

February 2, 2016

Sent Via Email

Chevron USA
100 Northpark Blvd.
Covington, LA 70433
Attn: Jim Floyd

HOUSTON, TX
PHONE (281) 397-9016
FAX (281) 397-6637

LAKE CHARLES, LA
PHONE (337) 625-6577
FAX (337) 625-6580

SHREVEPORT, LA
PHONE (318) 797-8636
FAX (318) 798-0478

**Re: First Quarter 2016 Entrainment Monitoring Report for the Chevron Jack and St. Malo
Floating Production Unit
CK Project No. 10726**

Dear Mr. Floyd:

CK Associates (CK) is providing this letter report to Chevron USA (Chevron) to summarize the findings of the first quarter 2016 entrainment monitoring event for intake water collected from the cooling water intake structure (CWIS) aboard the Jack and St. Malo (JSM) floating production unit (FPU). The JSM FPU is a fixed facility, for which construction was commenced after July 17, 2006. Therefore, quarterly entrainment monitoring is required for the JSM FPU CWIS in accordance with section 12.c.2.ii of the *NPDES General Permit for New and Existing Sources and New Dischargers in the Offshore Subcategory of the Oil and Gas Extraction Point Source Category for the Western Portion of the Outer Continental Shelf of the Gulf of Mexico (GMG290000)* (general permit), effective October 1, 2012.

Sample Collection

Entrainment samples were collected by Chevron personnel from a slip stream of the cooling water system. The slip stream begins downstream of the CWIS intake screens and upstream of the facility heat exchanger(s). The slip stream is passed through an entrainment monitoring device (EMD) consisting of a closed conduit with a 330 micrometer screen in line with the flow after which the stream is returned to the JSM cooling water system downstream of the facility heat exchanger(s).

The sampling process began at 0600 hours on January 6, 2016 and lasted until 0000 hours on January 7, 2016. The EMD was operated continuously during the sampling period at a flow rate of 19.0 gallons per minute resulting in an entrainment sample volume of 20,520 gallons. Sample collection data are summarized in Table 1. Upon sampling termination, the screen was removed from the EMD and washed of entrained particles into sample jars containing 10% buffered formalin. The sample jars were packed in an ice chest and shipped to CK for processing and species identification by a fisheries biologist. See attachments A and B for a copy of the field data sheet and chain of custody documentation respectively.

Sample Results

Samples were analyzed for the presence of eggs and larvae from yellowfin tuna, and red snapper. These species were identified in the FPU's general permit application as representative commercial and recreational species of concern because eggs and larvae of these species are considered to be most likely to be entrained in the JSM CWIS.

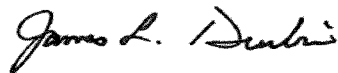
Zero yellowfin tuna eggs/larvae and zero red snapper eggs/larvae were identified during sample analysis. When normalized to the total facility flow, this entrainment rate amounts to zero eggs/larvae per cubic meter and zero species of concern entrained per day. A summary of the entrained species of concern is included in Table 2. Entrained organisms that were not listed as species of concern, but that were found in the entrainment samples included ctenophores, copepods, pteropods chaetognaths. Additionally, one Scaridae larva and three Mugilidae larvae. None of these organisms should be included as part of the discharge monitoring report submittal because they do not represent important commercial and recreational species of concern.

Conclusions

Zero organisms of important commercial and recreational species of concern were identified in entrainment samples collected from the JSM FPU during its first calendar quarter of entrainment monitoring. Based on the analysis of the entrainment monitoring samples, engineering controls installed at the JSM FPU CWIS have successfully minimized the potential for environmental, socioeconomic, and ecological damage due to entrainment in the facility CWIS.

If you have any questions or comments regarding this report, please do not hesitate to contact me at (255) 755-1000 or via email at James.Durbin@c-ka.com.

Sincerely yours,
CK Associates



James L. Durbin
Senior Environmental Scientist

Attachments: As referenced

Table 1
Sample Collection Data Summary by Quarter

Quarter	Year	Start Date and Time	Stop Date and Time	Flow Rate (gal/min)	Sample Volume (MG)	Collection Method
1	2016	01/6/16 0600	01/7/16 0000	19.0 (est)	0.020	Composite

Table 2
Entrainment Summary by Quarter

Quarter	Year	Species/Family	Total Collected	Sample Volume (MG)	Total # Entrained ¹
1	2016	<i>Thunnus albacares</i> (yellowfin tuna)	0	0.020	0
1	2016	<i>Lutjanus campechanus</i> (red snapper)	0	0.020	0
Total	2016	<i>Thunnus albacares</i> (yellowfin tuna)	0	N/A	0
Total	2016	<i>Lutjanus campechanus</i>(red snapper)	0	N/A	0

¹ Projected number of organisms entrained per quarter based on an average cooling water flow equal to 26.8 MGD for a 91-day quarter.

ATTACHMENT A
DATA SHEET FOR SAMPLE EVENT

Attachment A Data Sheet
Cooling Water Intake Structure Entrainment Sampling and Monitoring Procedures
Chevron North America Exploration and Production Company Deepwater
Jack St. Malo Platform

Collection Date	1/6/2016
Project Number	10726
Names of Personnel Collecting Samples	Kent Ertan, Clark Bergeron, Clint Ward
Sample Collection Flow Rate	≈ 19 GPM
Sample Event Start Time and Date	1-6-2016 0600 AM
Sample Event End Time and Date	1-7-2016 1200 AM
Weather Conditions during each cycle	5'---7' seas Clear sky 75 degrees
Number of Sample Jars Filled	4
Sample Collection Method	Side Stream
Other Notes Relevant to Sampling Event	<p>Normal operations. No facility upset Sea water Lift Pump on line entire time.</p> <p>Flow Rate unknown. Operators commented valves were open as on the last sample</p>

ATTACHMENT B
CHAIN-OF-CUSTODY FOR SAMPLE EVENT

**CHAIN OF CUSTODY
AND
ANALYTICAL REQUEST RECORD**

Page ____ of ____

CLIENT: Chevron NA, 3ack ST, 17th **P.O. NUMBER:** Not Applicable **SAMPLED BY:** Clint Ward
PROJECT NO.: 10726 **LABORATORY*:** CK Associates **DATE:** 1-6-2016

SAMPLE IDENTIFICATION	DATE	TIME	MATRIX	NO. OF CONTAINERS	PRESERVATIVE	ANALYSES AND INSTRUCTIONS	
Plankton	1-6-16	6:00am	Sea water	1	10% Formalin	Provide information on Species Composition abundance and size of entrained organism	
Plankton	1-6-16	12:00pm	Sea water	1	10% Formalin	" "	
Plankton	1-6-16	6:00pm	Sea water	1	10% Formalin	" "	
Plankton	1-7-16	12:00pm	Sea water	1	10% Formalin	" "	
						JSM 16010701	
Relinquished by:	(Name) <u>George Eby</u>	Date <u>1-7-16</u>	Time <u>2:00pm</u>	Received by:	(Name) <u>LEWIS CUNNEY</u>	Date <u>1-7-16</u>	Time <u>1401</u>
	(Signature) <u>[Signature]</u>	Date <u>1-7-16</u>	Time <u>2:00pm</u>		(Signature) <u>[Signature]</u>	Date	Time
Relinquished by:	(Name) <u>LEWIS CUNNEY</u>	Date <u>1/7/16</u>	Time <u>1552</u>	Received by:	(Name) <u>Devin Schexnayder</u>	Date <u>1-7-16</u>	Time <u>1:55</u>
	(Signature) <u>[Signature]</u>	Date	Time		(Signature) <u>[Signature]</u>	Date	Time
Method of Shipment:	<u>Devin Schexnayder</u> <u>Becky Ray</u>			Condition of Samples upon receipt at laboratory:			Temperature upon receipt
				<u>1/7/16</u> <u>1825</u>			

Please send results and invoice to the attention of _____ in our ☐ Baton Rouge, ☐ Lake Charles, ☐ Shreveport, ☐ Houston Office



17170 PERKINS ROAD
BATON ROUGE, LA 70810
PHONE (225) 755-1000
FAX (225) 751-2010
<http://www.c-ka.com>

May 10, 2016

Sent Via Email

Chevron USA
100 Northpark Blvd.
Covington, LA 70433
Attn: Jim Floyd

HOUSTON, TX
PHONE (281) 397-9016
FAX (281) 397-6637

LAKE CHARLES, LA
PHONE (337) 625-6577
FAX (337) 625-6580

SHREVEPORT, LA
PHONE (318) 797-8636
FAX (318) 798-0478

**Re: Second Quarter 2016 Entrainment Monitoring Report for the Chevron Jack and St. Malo Floating Production Unit
CK Project No. 10726**

Dear Mr. Floyd:

CK Associates (CK) is providing this letter report to Chevron USA (Chevron) to summarize the findings of the second quarter 2016 entrainment monitoring event for intake water collected from the cooling water intake structure (CWIS) aboard the Jack and St. Malo (JSM) floating production unit (FPU). The JSM FPU is a fixed facility, for which construction was commenced after July 17, 2006. Therefore, quarterly entrainment monitoring is required for the JSM FPU CWIS in accordance with section 12.c.2.ii of the *NPDES General Permit for New and Existing Sources and New Dischargers in the Offshore Subcategory of the Oil and Gas Extraction Point Source Category for the Western Portion of the Outer Continental Shelf of the Gulf of Mexico (GMG290000)* (general permit), effective October 1, 2012.

Sample Collection

Entrainment samples were collected by Chevron personnel from a slip stream of the cooling water system. The slip stream begins downstream of the CWIS intake screens and upstream of the facility heat exchanger(s). The slip stream is passed through an entrainment monitoring device (EMD) consisting of a closed conduit with a 330 micrometer screen in line with the flow after which the stream is returned to the JSM cooling water system downstream of the facility heat exchanger(s).

The sampling process began at 2000 hours on April 5, 2016 and lasted until 2000 hours on April 6, 2016. The EMD was operated continuously during the sampling period at a flow rate of 7.0 gallons per minute resulting in an entrainment sample volume of 10,080 gallons. Sample collection data are summarized in Table 1. Upon sampling termination, the screen was removed from the EMD and washed of entrained particles into sample jars containing 10% buffered formalin. The sample jars were packed in an ice chest and shipped to CK for processing and species identification by a fisheries biologist. See attachments A and B for a copy of the field data sheet and chain of custody documentation respectively.

Sample Results

Samples were analyzed for the presence of eggs and larvae from yellowfin tuna, and red snapper. These species were identified in the FPU's general permit application as key representative commercial and recreational species of concern because eggs and larvae of these species are considered to be most likely to be entrained in the JSM CWIS.

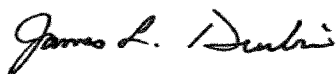
Zero yellowfin tuna eggs/larvae and zero red snapper eggs/larvae were identified during sample analysis. When normalized to the total facility flow, this entrainment rate amounts to zero eggs/larvae per cubic meter and zero key species of concern entrained per day. A summary of the entrained key species of concern is included in Table 2. In addition to any key species of concern identified, there were other ichthyoplankton observed in the sample. Two additional fish eggs were found; however, they could not be identified because of the lack of development structures. There were no additional fish larvae observed in the sample, see Table 3. Other entrained organisms that were not listed as key species of concern and are not ichthyoplankton, but that were found in the entrainment samples included Amphipods, Mysid shrimp, polychaetes, ctenophores, copepods, pteropods, chaetognaths, see Table 4. None of these organisms should be included as part of the discharge monitoring report submittal because they do not represent key important commercial and recreational species of concern.

Conclusions

Zero organisms of key important commercial and recreational species of concern were identified in entrainment samples collected from the JSM FPU during its second calendar quarter of entrainment monitoring. Based on the analysis of the entrainment monitoring samples, engineering controls installed at the JSM FPU CWIS have successfully minimized the potential for environmental, socioeconomic, and ecological damage due to entrainment in the facility CWIS.

If you have any questions or comments regarding this report, please do not hesitate to contact me at (255) 755-1000 or via email at James.Durbin@c-ka.com.

Sincerely yours,
CK Associates



James L. Durbin
Senior Environmental Scientist

Attachments: As referenced

Table 1
Sample Collection Data Summary by Quarter

Quarter	Year	Start Date and Time	Stop Date and Time	Sample Flow Rate (gal/min)	Sample Volume (MG)	Collection Method
2	2016	04/5/16 2000	04/6/16 2000	7.0 (est)	0.010	Composite

Table 2
Entrainment Summary by Quarter
(Key Important Commercial and Recreational Species of Concern)

Quarter	Year	Species/Family	Total Collected Eggs	Total Collected Larvae	Sample Volume (MG)	Total # Eggs Entrained ¹	Total # Larvae Entrained ¹
1	2016	<i>Thunnus albacares</i> (yellowfin tuna)	0	0	0.020	0	0
		<i>Lutjanus campechanus</i> (red snapper)	0	0		0	0
2	2016	<i>Thunnus albacares</i> (yellowfin tuna)	0	0	0.010	0	0
		<i>Lutjanus campechanus</i> (red snapper)	0	0		0	0
Total	2016	<i>Thunnus albacares</i> (yellowfin tuna)	0	0	N/A	0	0
Total	2016	<i>Lutjanus campechanus</i> (red snapper)	0	0	N/A	0	0

¹ Projected number of organisms entrained per quarter based on an average cooling water flow equal to 26.8 MGD for a 91-day quarter

Table 3
Other Ichthyoplankton
(Non Key Commercial and Recreational Species of Concern)

Quarter	Year	Species/Family	Total Collected Eggs	Total Collected Larvae	Sample Volume (MG)	Total # Eggs Entrained ¹	Total # Larvae Entrained ¹
1	2016	<i>Scaridae</i>	0	1	0.020	0	121,940
		<i>Mugilidae</i>	0	3		0	365,820
2	2016	N/A	2	0	0.010	487,760	0
			0	0		0	0
Total	2016	<i>Eggs</i>	2	0	N/A	487,760	0
Total	2016	<i>Larvae</i>	0	4	N/A	0	487,760

¹ Projected number of organisms entrained per quarter based on an average cooling water flow equal to 26.8 MGD for a 91-day quarter

Table 4
Other Non-Ichthyoplankton Entrained Organisms

Amphipods	Chaetognaths	Copepods	Ctenophores
Polychaetes	Mysid shrimp		Pteropods

ATTACHMENT A
DATA SHEET FOR SAMPLE EVENT

Attachment A Data Sheet
Cooling Water Intake Structure Entrainment Sampling and Monitoring Procedures
Chevron North America Exploration and Production Company Deepwater
Jack St. Malo Platform

Collection Date 4-6-16

Project Number 10726

Names of Personnel Collecting Samples Clint Ward

Sample Collection Flow Rate 7 gpm

Sample Event Start Time and Date 4-5-16 20:00

Sample Event End Time and Date 4-6-16 20:00

Weather Conditions during each cycle Calm Seas Clear Sky

Number of Sample Jars Filled 4

Sample Collection Method online screen sample.

Other Notes Relevant to Sampling Event

Preservation Fluids
had leaked out of
Jars. Marks on Sample
Bottles indicate amount
of preservatives before
Adding Seawater Sample.

All Samples went well. No
Issues.

ATTACHMENT B
CHAIN-OF-CUSTODY FOR SAMPLE EVENT

**CHAIN OF CUSTODY
AND
ANALYTICAL REQUEST RECORD**

CLIENT: Chevron NA Sack St Palo P.O. NUMBER: SAMPLED BY: Celine Milton / Clint Ward
PROJECT NO.: 107216 LABORATORY*: CK Associates DATE: 4/6/16

SAMPLE IDENTIFICATION	DATE	TIME	MATRIX	NO. OF CONTAINERS	PRESERVATIVE	ANALYSES AND INSTRUCTIONS
Plankton	4-6-16	0200	seawater	1	100% Formalin	Provide info on Species Composition Abundance + Size.
Plankton	4-6-16	0800	seawater	1	100% Formalin	"
Plankton	4-6-16	1400	seawater	1	100% Formalin	"
Plankton	4/6/16	2000	seawater	1	100% Formalin	"
						JSM16040701

Relinquished by:	(Name) <u>Clay W. Rodrigue</u>	Date <u>4-7-16</u>	Time <u>8:00 am</u>	Received by:	(Name) <u>GARY Wegner</u>	Date <u>4-7-2016</u>	Time <u>08:20</u>
	(Signature) <u>Clay W. Rodrigue</u>	Date <u>4-7-16</u>	Time <u>8:00 am</u>		(Signature) <u>GARY Wegner</u>	Date <u>4-7-16</u>	Time <u>08:20</u>
Relinquished by:	(Name) <u>GARY Wegner</u>	Date <u>4-7-16</u>	Time <u>1025</u>	Received by Laboratory:	(Name) <u>Robert Waddell</u>	Date <u>4-7-16</u>	Time <u>1151</u>
	(Signature) <u>GARY Wegner</u>	Date <u>4-7-16</u>	Time <u>1025</u>		(Signature) <u>[Signature]</u>	Date <u>4-7-16</u>	Time <u>1151</u>
Method of Shipment: <u>Commercial Carrier</u>		Condition of Samples upon receipt at laboratory: <u>iced</u>				Temperature upon receipt	

Please send results and invoice to the attention of Robert Waddell 4-7-16 in our ☐ Baton Rouge, ☐ Lake Charles, ☐ Shreveport, ☐ Houston Office
1430



17170 PERKINS ROAD
BATON ROUGE, LA 70810
PHONE (225) 755-1000
FAX (225) 751-2010
<http://www.c-ka.com>

August 8, 2016

Sent Via Email

Chevron USA
100 Northpark Blvd.
Covington, LA 70433
Attn: Jim Floyd

HOUSTON, TX
PHONE (281) 397-9016
FAX (281) 397-6637

LAKE CHARLES, LA
PHONE (337) 625-6577
FAX (337) 625-6580

SHREVEPORT, LA
PHONE (318) 797-8636
FAX (318) 798-0478

**Re: Third Quarter 2016 Entrainment Monitoring Report for the Chevron Jack and St. Malo
Floating Production Unit
CK Project No. 10726**

Dear Mr. Floyd:

CK Associates (CK) is providing this letter report to Chevron USA (Chevron) to summarize the findings of the third quarter 2016 entrainment monitoring event for intake water collected from the cooling water intake structure (CWIS) aboard the Jack and St. Malo (JSM) floating production unit (FPU). The JSM FPU is a fixed facility, for which construction was commenced after July 17, 2006. Therefore, quarterly entrainment monitoring is required for the JSM FPU CWIS in accordance with section 12.c.2.ii of the *NPDES General Permit for New and Existing Sources and New Dischargers in the Offshore Subcategory of the Oil and Gas Extraction Point Source Category for the Western Portion of the Outer Continental Shelf of the Gulf of Mexico (GMG290000)* (general permit), effective October 1, 2012.

Sample Collection

Entrainment samples were collected by Chevron personnel from a slip stream of the cooling water system. The slip stream begins downstream of the CWIS intake screens and upstream of the facility heat exchanger(s). The slip stream is passed through an entrainment monitoring device (EMD) consisting of a closed conduit with a 330 micrometer screen in line with the flow after which the stream is returned to the JSM cooling water system downstream of the facility heat exchanger(s).

The sampling process began at 0900 hours on July 4, 2016 and lasted until 0900 hours on July 5, 2016. The EMD was operated continuously during the sampling period at a flow rate of 34.4 gallons per minute resulting in an entrainment sample volume of 49,536 gallons. Sample collection data are summarized in Table 1. Upon sampling termination, the screen was removed from the EMD and washed of entrained particles into sample jars containing 10% buffered formalin. The sample jars were packed in an ice chest and shipped to CK for processing and species identification by a fisheries biologist. See attachments A and B for a copy of the field data sheet and chain of custody documentation respectively.

Sample Results

Samples were analyzed for the presence of eggs and larvae from yellowfin tuna, and red snapper. These species were identified in the FPU's general permit application as key representative commercial and recreational species of concern because eggs and larvae of these species are considered to be most likely to be entrained in the JSM CWIS.

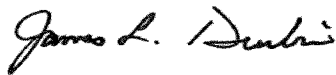
Zero yellowfin tuna eggs/larvae and zero red snapper eggs/larvae were identified during sample analysis. When normalized to the total facility flow, this entrainment rate amounts to zero eggs/larvae per cubic meter and zero key species of concern entrained per day. A summary of the entrained key species of concern is included in Table 2. In addition to any key species of concern identified, there were other ichthyoplankton observed in the sample. One additional fish egg was found. There were no additional fish larvae observed in the sample, see Table 3. Other entrained organisms that were not listed as key species of concern and are not ichthyoplankton, but that were found in the entrainment samples included Amphipoda, *Acetes americanus carolinae*, Ctenophores, copepods, pteropoda, Chaetognatha, see Table 4. None of these organisms should be included as part of the discharge monitoring report submittal because they do not represent key important commercial and recreational species of concern.

Conclusions

Zero organisms of key important commercial and recreational species of concern were identified in entrainment samples collected from the JSM FPU during its third calendar quarter of entrainment monitoring. Based on the analysis of the entrainment monitoring samples, engineering controls installed at the JSM FPU CWIS have successfully minimized the potential for environmental, socioeconomic, and ecological damage due to entrainment in the facility CWIS.

If you have any questions or comments regarding this report, please do not hesitate to contact me at (255) 755-1000 or via email at James.Durbin@c-ka.com.

Sincerely yours,
CK Associates



James L. Durbin
Senior Environmental Scientist

Attachments: As referenced

Table 1
Sample Collection Data Summary by Quarter

Quarter	Year	Start Date and Time	Stop Date and Time	Sample Flow Rate (gal/min)	Sample Volume (MG)	Collection Method
3	2016	07/4/16 0900	07/5/16 0900	34.4 (est)	0.049	Composite

Table 2
Entrainment Summary by Quarter
(Key Important Commercial and Recreational Species of Concern)

Quarter	Year	Species/Family	Total Collected Eggs	Total Collected Larvae	Sample Volume (MG)	Total # Eggs Entrained ¹	Total # Larvae Entrained ¹
1	2016	<i>Thunnus albacares</i> (yellowfin tuna)	0	0	0.020	0	0
		<i>Lutjanus campechanus</i> (red snapper)	0	0		0	0
2	2016	<i>Thunnus albacares</i> (yellowfin tuna)	0	0	0.010	0	0
		<i>Lutjanus campechanus</i> (red snapper)	0	0		0	0
3	2016	<i>Thunnus albacares</i> (yellowfin tuna)	0	0	0.049	0	0
		<i>Lutjanus campechanus</i> (red snapper)	0	0		0	0
Total	2016	<i>Thunnus albacares</i> (yellowfin tuna)	0	0	N/A	0	0
Total	2016	<i>Lutjanus campechanus</i>(red snapper)	0	0	N/A	0	0

¹ Projected number of organisms entrained per quarter based on an average cooling water flow equal to 26.8 MGD for a 91-day quarter

Table 3
Other Ichthyoplankton
(Non Key Commercial and Recreational Species of Concern)

Quarter	Year	Species/Family	Total Collected Eggs	Total Collected Larvae	Sample Volume (MG)	Total # Eggs Entrained ¹	Total # Larvae Entrained ¹
1	2016	Scaridae	0	1	0.020	0	121,940
		Mugilidae	0	3		0	365,820
2	2016	N/A	2	0	0.010	487,760	0
3	2016	Clupeidae	1	0	0.049	49,771	0
Total	2016	Eggs	3	0	N/A	537,531	0
Total	2016	Larvae	0	4	N/A	0	487,760

¹ Projected number of organisms entrained per quarter based on an average cooling water flow equal to 26.8 MGD for a 91-day quarter

Table 4
Other Non-Ichthyoplankton Entrained Organisms

<i>Acetes americanus carolinae</i>	Amphipoda	Chaetognatha
copepods	Ctenophores	pteropods

ATTACHMENT A
DATA SHEET FOR SAMPLE EVENT

Attachment A Data Sheet
Cooling Water Intake Structure Entrainment Sampling and Monitoring Procedures
Chevron North America Exploration and Production Company Deepwater
Jack St. Malo Platform

Collection Date 7/4/2016

Project Number 10726

Names of Personnel Collecting Samples Kent Ertan / Joel Vidrine

Sample Collection Flow Rate 34.4

Sample Event Start Time and Date 09:00 / 7/4/2016

Sample Event End Time and Date 09:00 / 7/5/2016

Weather Conditions during each cycle Calm / Sunny

Number of Sample Jars Filled 4

Sample Collection Method Filtered Screen / 26HR

Other Notes Relevant to Sampling Event

ATTACHMENT B
CHAIN-OF-CUSTODY FOR SAMPLE EVENT

CHAIN OF CUSTODY AND ANALYTICAL REQUEST RECORD

Page ____ of ____

CLIENT: <u>Chevron / Jack St. Melo</u>			P.O. NUMBER: <u>N/A</u>			SAMPLED BY: <u>Kent Ertan / Joel Vidrine</u>		
PROJECT NO.: <u>10726</u>			LABORATORY*: <u>CK Associates</u>			DATE: <u>7/4/16</u>		

SAMPLE IDENTIFICATION	DATE	TIME	MATRIX	NO. OF CONTAINERS	PRESERVATIVE	ANALYSES AND INSTRUCTIONS
Plankton	7/4/16	15:00	Sea-Water	1	Kent Ertan	Provide information of Species Composition.
Plankton	7/4/16	21:00	Sea-Water	2	Joel Vidrine	-
Plankton	7/5/16	03:00	Sea-Water	3	Joel Vidrine	-
Plankton	7/5/16	09:00	Sea-Water	4	Kent Ertan	-
						JSM 16071101

Relinquished by:	(Name) <u>Kent Ertan</u>	Date <u>7/6/16</u>	Time <u>11:00</u>	Received by:	(Name) <u>Taylor Griffin</u>	Date <u>7/6/16</u>	Time <u>11:00</u>
	(Signature) <u>[Signature]</u>	Date <u>7/6/16</u>	Time <u>11:00</u>		(Signature) <u>[Signature]</u>	Date <u>7/6/16</u>	Time <u>11:00</u>
Relinquished by:	(Name) <u>Kent Taylor Griffin</u>	Date <u>7/6/16</u>	Time <u>12:33</u>	Received by:	(Name) <u>Chris Welch</u>	Date <u>7-11-16</u>	Time <u>1450</u>
	(Signature) <u>[Signature]</u>	Date <u>7/10/16</u>	Time <u>12:33</u>		(Signature) <u>[Signature]</u>	Date <u>7-11-16</u>	Time <u>1450</u>
Method of Shipment: <u>Commercial Fed Ex, USPS or Carrier</u>				Condition of Samples upon receipt at laboratory: <u>Intact</u>			Temperature upon receipt

Please send results and invoice to the attention of George Obey 1-985-773-5173 in our ☐ Baton Rouge, ☐ Lake Charles, ☐ Shreveport, ☐ Houston Office

WHITE COPY TO ACCOMPANY SAMPLE • RETAIN YELLOW COPY FOR FILES • RETAIN PINK COPY FOR FIELD SUPERVISOR

CK-100



17170 PERKINS ROAD
BATON ROUGE, LA 70810
PHONE (225) 755-1000
FAX (225) 751-2010
<http://www.c-ka.com>

November 4, 2016

Sent Via Email

Chevron USA
100 Northpark Blvd.
Covington, LA 70433
Attn: Jim Floyd

HOUSTON, TX
PHONE (281) 397-9016
FAX (281) 397-6637

LAKE CHARLES, LA
PHONE (337) 625-6577
FAX (337) 625-6580

SHREVEPORT, LA
PHONE (318) 797-8636
FAX (318) 798-0478

**Re: Fourth Quarter 2016 Entrainment Monitoring Report for the Chevron Jack and St. Malo Floating Production Unit
CK Project No. 10726**

Dear Mr. Floyd:

CK Associates (CK) is providing this letter report to Chevron USA (Chevron) to summarize the findings of the fourth quarter 2016 entrainment monitoring event for intake water collected from the cooling water intake structure (CWIS) aboard the Jack and St. Malo (JSM) floating production unit (FPU). The JSM FPU is a fixed facility, for which construction was commenced after July 17, 2006. Therefore, quarterly entrainment monitoring is required for the JSM FPU CWIS in accordance with section 12.c.2.ii of the *NPDES General Permit for New and Existing Sources and New Dischargers in the Offshore Subcategory of the Oil and Gas Extraction Point Source Category for the Western Portion of the Outer Continental Shelf of the Gulf of Mexico (GMG290000)* (general permit), effective October 1, 2012.

Sample Collection

Entrainment samples were collected by Chevron personnel from a slip stream of the cooling water system. The slip stream begins downstream of the CWIS intake screens and upstream of the facility heat exchanger(s). The slip stream is passed through an entrainment monitoring device (EMD) consisting of a closed conduit with a 330 micrometer screen in line with the flow after which the stream is returned to the JSM cooling water system downstream of the facility heat exchanger(s).

The sampling process began at 1815 hours on October 21, 2016 and lasted until 1215 hours on October 22, 2016. The EMD was operated continuously during the sampling period at a flow rate of 13.4 gallons per minute resulting in an entrainment sample volume of 14,472 gallons. Sample collection data are summarized in Table 1. Upon sampling termination, the screen was removed from the EMD and washed of entrained particles into sample jars containing 10% buffered formalin. The sample jars were packed in an ice chest and shipped to CK for processing and species identification by a fisheries biologist. See attachments A and B for a copy of the field data sheet and chain of custody documentation respectively.

Sample Results

Samples were analyzed for the presence of eggs and larvae from yellowfin tuna, and red snapper. These species were identified in the FPU's general permit application as key representative commercial and recreational species of concern because eggs and larvae of these species are considered to be most likely to be entrained in the JSM CWIS.

Zero yellowfin tuna eggs/larvae and zero red snapper eggs/larvae were identified during sample analysis. When normalized to the total facility flow, this entrainment rate amounts to zero eggs/larvae per cubic meter and zero key species of concern entrained per day. A summary of the entrained key species of concern is included in Table 2. There were no additional ichthyoplankton (eggs/larvae) observed in the sample see Table 3. Other entrained organisms that were not listed as key species of concern and are not ichthyoplankton, but that were found in the entrainment samples included copepods, Chaetognatha, *Callinectes sapidus* (two - megalopa) see Table 4. None of these organisms should be included as part of the discharge monitoring report submittal because they do not represent key important commercial and recreational species of concern.

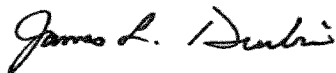
Conclusions

Zero organisms of key important commercial and recreational species of concern were identified in entrainment samples collected from the JSM FPU during its fourth calendar quarter of entrainment monitoring. Based on the analysis of the entrainment monitoring samples, engineering controls installed at the JSM FPU CWIS have successfully minimized the potential for environmental, socioeconomic, and ecological damage due to entrainment in the facility CWIS.

If you have any questions or comments regarding this report, please do not hesitate to contact me at (255) 755-1000 or via email at James.Durbin@c-ka.com.

Sincerely yours,

CK Associates



James L. Durbin

Senior Environmental Scientist

Attachments: As referenced

Table 1
Sample Collection Data Summary by Quarter

Quarter	Year	Start Date and Time	Stop Date and Time	Sample Flow Rate (gal/min)	Sample Volume (MG)	Collection Method
4	2016	10/21/16 1815	10/22/16 1215	13.4 (est)	0.014	Composite

Table 2
Entrainment Summary by Quarter
(Key Important Commercial and Recreational Species of Concern)

Quarter	Year	Species/Family	Total Collected Eggs	Total Collected Larvae	Sample Volume (MG)	Total # Eggs Entrained ¹	Total # Larvae Entrained ¹
1	2016	<i>Thunnus albacares</i> (yellowfin tuna)	0	0	0.020	0	0
		<i>Lutjanus campechanus</i> (red snapper)	0	0		0	0
2	2016	<i>Thunnus albacares</i> (yellowfin tuna)	0	0	0.010	0	0
		<i>Lutjanus campechanus</i> (red snapper)	0	0		0	0
3	2016	<i>Thunnus albacares</i> (yellowfin tuna)	0	0	0.049	0	0
		<i>Lutjanus campechanus</i> (red snapper)	0	0		0	0
4	2016	<i>Thunnus albacares</i> (yellowfin tuna)	0	0	0.014	0	0
		<i>Lutjanus campechanus</i> (red snapper)	0	0		0	0
Total	2016	<i>Thunnus albacares</i> (yellowfin tuna)	0	0	N/A	0	0
Total	2016	<i>Lutjanus campechanus</i>(red snapper)	0	0	N/A	0	0

¹ Projected number of organisms entrained per quarter based on an average cooling water flow equal to 26.8 MGD for a 91-day quarter

Table 3
Other Ichthyoplankton
(Non Key Commercial and Recreational Species of Concern)

Quarter	Year	Species/Family	Total Collected Eggs	Total Collected Larvae	Sample Volume (MG)	Total # Eggs Entrained ¹	Total # Larvae Entrained ¹
1	2016	Scaridae	0	1	0.020	0	121,940
		Mugilidae	0	3		0	365,820
2	2016	N/A	2	0	0.010	487,760	0
3	2016	Clupeidae	1	0	0.049	49,771	0
4	2016	N/A	0	0	0.014	0	0
Total	2016	Eggs	3	0	N/A	537,531	0
Total	2016	Larvae	0	4	N/A	0	487,760

¹ Projected number of organisms entrained per quarter based on an average cooling water flow equal to 26.8 MGD for a 91-day quarter

Table 4
Other Non-Ichthyoplankton Entrained Organisms

copepods	Chaetognatha	<i>Callinectes sapidus</i> (2 - megalopa)
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ATTACHMENT A
DATA SHEET FOR SAMPLE EVENT

Attachment A - Example Data Sheet
Cooling Water Intake Structure Entrainment Sampling and Monitoring Procedures
Chevron North America Exploration and Production Company Deepwater
Jack St. Malo Platform

Collection Date 10/21/2016

Project Number 10726

Names of Personnel Collecting Samples 4

Sample Collection Flow Rate 13.4

Sample Event Start Time and Date 6:15 PM 10/21/2016

Sample Event End Time and Date 12:15 PM 10/22/2016

Weather Conditions during each cycle 4FT SE WINDS 12 KNOTS

Number of Sample Jars Filled 4

Sample Method Entrainment Kit

Other Notes Relevant to Sampling Event

ATTACHMENT B
CHAIN-OF-CUSTODY FOR SAMPLE EVENT

CHAIN OF CUSTODY AND ANALYTICAL REQUEST RECORD

Page 1 of 1

CLIENT: <u>Cherron / Jack St. Malo</u>		P.O. NUMBER: <u>Not Applicable</u>		SAMPLED BY: <u>Kent Ertan / Clark Bergen</u>	
PROJECT NO.: <u>10726</u>		LABORATORY*: <u>CK Associates</u>		DATE: <u>10/21/2016</u>	

SAMPLE IDENTIFICATION	DATE	TIME	MATRIX	NO. OF CONTAINERS	PRESERVATIVE	ANALYSES AND INSTRUCTIONS
Plankton	10-21-16	6:15PM	SEA-WATER	1	100% Formalin	Provide information on species composition, abundance and size entrained organisms.
Plankton	10-22-16	12:15AM	SEA-WATER	2	100% Formalin	Provide information on species composition, abundance and size entrained organisms.
Plankton	10-22-16	6:15AM	SEA-WATER	3	100% Formalin	Provide information on species composition, abundance and size entrained organisms.
Plankton	10-22-16 12:15AM	12:15PM	SEA-WATER	4	100% Formalin	Provide information on species composition, abundance and size entrained organisms.

Relinquished by:	(Name) <u>George Obery</u>	Date <u>10-24-16</u>	Time <u>9:00 AM</u>	Received by:	(Name) <u>Christy Potts</u>	Date <u>10/24/16</u>	Time <u>9:00 AM</u>
	(Signature) <u>George Obery</u>	Date <u>10-24-16</u>	Time <u>9:00 AM</u>		(Signature) <u>Christy Potts</u>	Date <u>10/24/16</u>	Time <u>9:00 AM</u>
Relinquished by:	(Name) <u>Christy Potts</u>	Date <u>10/24/16</u>	Time <u>10:08 AM</u>	Received by Laboratory:	(Name) <u>Shane Boutte</u>	Date <u>10/24/16</u>	Time <u>10:08 AM</u>
	(Signature) <u>Christy Potts</u>	Date <u>10/24/16</u>	Time <u>10:08 AM</u>		(Signature) <u>Shane Boutte</u>	Date <u>10/24/16</u>	Time <u>10:08 AM</u>

Method of Shipment: <u>Relinquished by Shane Boutte</u>	Condition of Samples upon receipt at laboratory: <u>10/24/16 12:16</u>	Temperature upon receipt: <u>Ambient</u>
--	---	---

received by lab: Chris Welch 10-24-16 12:16

Please send results and invoice to the attention of _____ in our ☐ Baton Rouge, ☐ Lake Charles, ☐ Shreveport, ☐ Houston Office

April 12, 2017

Chevron USA
100 Northpark Blvd.
Covington, LA 70433
Attn: Jim Floyd
Jim.floyd@chevron.comHOUSTON, TX
PHONE (281) 397-9016
FAX (281) 397-6637LAKE CHARLES, LA
PHONE (337) 625-6577
FAX (337) 625-6580SHREVEPORT, LA
PHONE (318) 797-8636
FAX (318) 798-0478

**Re: First Quarter 2017 Entrainment Monitoring Report for the Chevron Jack and St. Malo
Floating Production Unit
CK Project No. 10726**

Dear Mr. Floyd:

CK Associates (CK) is providing this letter report to Chevron USA (Chevron) to summarize the findings of the first quarter 2017 entrainment monitoring event for intake water collected from the cooling water intake structure (CWIS) aboard the Jack and St. Malo (JSM) floating production unit (FPU). The JSM FPU is a fixed facility, for which construction was commenced after July 17, 2006. Therefore, quarterly entrainment monitoring is required for the JSM FPU CWIS in accordance with section 12.c.2.ii of the *NPDES General Permit for New and Existing Sources and New Dischargers in the Offshore Subcategory of the Oil and Gas Extraction Point Source Category for the Western Portion of the Outer Continental Shelf of the Gulf of Mexico (GMG290000)* (general permit), effective October 1, 2012.

Sample Collection

Entrainment samples were collected by Chevron personnel from a slip stream of the cooling water system. The slip stream begins downstream of the CWIS intake screens and upstream of the facility heat exchanger(s). The slip stream is passed through an entrainment monitoring device (EMD) consisting of a closed conduit with a 330 micrometer screen in line with the flow after which the stream is returned to the JSM cooling water system downstream of the facility heat exchanger(s).

The sampling process began at 2100 hours on January 5, 2017 and lasted until 2100 hours on January 6, 2017. The EMD was operated continuously during the sampling period at a flow rate of 20.0 gallons per minute resulting in an entrainment sample volume of 28,800 gallons. Sample collection data are summarized in Table 1. Upon sampling termination, the screen was removed from the EMD and washed of entrained particles into sample jars containing 10% buffered formalin. The sample jars were packed in an ice chest and shipped to CK for processing and species identification by a fisheries biologist. See attachments A and B for a copy of the field data sheet and chain of custody documentation respectively.

Sample Results

Samples were analyzed for the presence of eggs and larvae from yellowfin tuna, and red snapper. These species were identified in the FPU's general permit application as key representative commercial and recreational species of concern because eggs and larvae of these species are considered to be most likely to be entrained in the JSM CWIS.

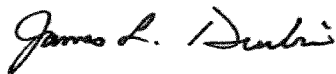
Zero yellowfin tuna eggs/larvae and zero red snapper eggs/larvae were identified during sample analysis. When normalized to the total facility flow, this entrainment rate amounts to zero eggs/larvae per cubic meter and zero key species of concern entrained per day. A summary of the entrained key species of concern is included in Table 2. There were additional ichthyoplankton larvae observed in the sample, see Table 3. One possible Gempylidae, however only the head was present and it was difficult to identify any further. Additionally, there were three Haemulidae and two Sparidae, but again both were too damaged to be identify further. There were no ichthyoplankton eggs observed in the sample see Table 3. Other entrained organisms that were not listed as key species of concern and are not ichthyoplankton, but that were found in the entrainment samples included copepoda, ctenophora, Chaetognatha, Amphipoda, *Lucifer faxoni*, *Branchiostoma floridae*, Cladoceran, Polychaete, bivalve and pteropoda see Table 4. None of these organisms should be included as part of the discharge monitoring report submittal because they do not represent key important commercial and recreational species of concern.

Conclusions

Zero organisms of key important commercial and recreational species of concern were identified in entrainment samples collected from the JSM FPU during its first calendar quarter of entrainment monitoring. Based on the analysis of the entrainment monitoring samples, engineering controls installed at the JSM FPU CWIS have successfully minimized the potential for environmental, socioeconomic, and ecological damage due to entrainment in the facility CWIS.

If you have any questions or comments regarding this report, please do not hesitate to contact me at (255) 755-1000 or via email at James.Durbin@c-ka.com.

Sincerely yours,
CK Associates



James L. Durbin
Senior Environmental Scientist

Attachments: As referenced

Table 1
Sample Collection Data Summary by Quarter

Quarter	Year	Start Date and Time	Stop Date and Time	Sample Flow Rate (gal/min)	Sample Volume (MG)	Collection Method
1	2017	01/5/17 2100	01/6/17 2100	20.0 (est)	0.029	Composite

Table 2
Entrainment Summary by Quarter
(Key Important Commercial and Recreational Species of Concern)

Quarter	Year	Species/Family	Total Collected Eggs	Total Collected Larvae	Sample Volume (MG)	Total # Eggs Entrained ¹	Total # Larvae Entrained ¹
1	2017	<i>Thunnus albacares</i> (yellowfin tuna)	0	0	0.029	0	0
		<i>Lutjanus campechanus</i> (red snapper)	0	0		0	0
Total	2017	<i>Thunnus albacares</i> (yellowfin tuna)	0	0	N/A	0	0
Total	2017	<i>Lutjanus campechanus</i> (red snapper)	0	0	N/A	0	0

¹ Projected number of organisms entrained per quarter based on an average cooling water flow equal to 26.8 MGD for a 91-day quarter

Table 3
Other Ichthyoplankton
(Non Key Commercial and Recreational Species of Concern)

Quarter	Year	Species/Family	Total Collected Eggs	Total Collected Larvae	Sample Volume (MG)	Total # Eggs Entrained ¹	Total # Larvae Entrained ¹
1	2017	Gempylidae	0	1	0.029	0	84,097
		Haemulidae	0	3		0	252,290
		Sparidae	0	2		0	168,193
Total	2017	Larvae	0	6	N/A	0	504,580

¹ Projected number of organisms entrained per quarter based on an average cooling water flow equal to 26.8 MGD for a 91-day quarter

Table 4
Other Non-Ichthyoplankton Entrained Organisms

copepoda	Ctenophora	Chaetognatha
Amphipoda	<i>Lucifer faxoni</i>	<i>Bronchiostoma floridae</i>
Cladoceran	Polychaete	Bivalve
pteropoda		

ATTACHMENT A
DATA SHEET FOR SAMPLE EVENT

Attachment A - Data Sheet
Cooling Water Intake Structure Entrainment Sampling and Monitoring Procedures
Chevron North America Exploration and Production Company Deepwater
Jack St. Malo Platform

Collection Date 1/6/17 - 1/6/17 ⁵ ^{CR}

Project Number 10726

Names of Personnel Collecting Samples Josh Jaques / Billy Spinner

Sample Collection Flow Rate 20 GPM

Sample Event Start Time and Date 2100 ^{CR}
~~03:00 AM~~ 1/6/17 ⁵ ^{CR}

Sample Event End Time and Date 21 00 1/6/17

Weather Conditions during each cycle Calm and Sunny into Dark w/ Rough Seas
4 10-12

Number of Sample Jars Filled 4

Sample Method

Other Notes Relevant to Sampling Event

Cold Front Moved Thru
Air Temp 76° - 56°
Wind Speed 15-18 Thru 35-38 Knots

Other Than weather, No Significant
Events Occurred during the Sample

ATTACHMENT B
CHAIN-OF-CUSTODY FOR SAMPLE EVENT

**CHAIN OF CUSTODY
AND
ANALYTICAL REQUEST RECORD**

Page ____ of ____

CLIENT: <u>Chevron N.A. Jack St Mls</u>		P.O. NUMBER: <u>101/A</u>		SAMPLED BY: <u>Josh Jacques / Billy Spinner</u>	
PROJECT NO.: <u>10726</u>		LABORATORY: <u>C.K. Associates</u>		DATE: <u>1/6/2017</u>	

SAMPLE IDENTIFICATION	DATE ^(CP)	TIME ^(CP)	MATRIX	NO. OF CONTAINERS	PRESERVATIVE	ANALYSES AND INSTRUCTIONS
Plankton	1/5/17	21:00	Sea Water	1	100% Formalin	
Plankton	1/6/17	09:00	Sea Water	2	100% Formalin	
Plankton	1/6/17	15:00	Sea Water	3	100% Formalin	JSM 17011101
Plankton	1/6/17	21:00	Sea Water	4	100% Formalin	

Relinquished by:	(Name) <u>Clay W. Rodriguez</u>	Date <u>1/11/17</u>	Time <u>05:00</u>	Received by:	(Name) <u>ROBIN L ROGERS</u>	Date <u>1/11/17</u>	Time
	(Signature) <u>[Signature]</u>	Date <u>1/11/17</u>	Time <u>10:25 am</u>		(Signature) <u>[Signature]</u>	Date <u>1/11/17</u>	Time <u>10:25</u>
Relinquished by:	(Name) <u>Edward Morgan</u>	Date <u>1/11/17</u>	Time <u>12:30</u>	Received by:	(Name) <u>ROBIN L ROGERS</u>	Date <u>1/11/17</u>	Time <u>12:30</u>
	(Signature) <u>[Signature]</u>	Date <u>1/11/17</u>	Time <u>12:30</u>		(Signature) <u>[Signature]</u>	Date <u>1/11/17</u>	Time <u>12:30</u>

Method of Shipment: <u>Hot/Hot</u>	Condition of Samples upon receipt at laboratory: <u>Reco lab 1.11.17 1500 hrs Samples intact</u>	Temperature upon receipt: <u>Ambient</u>
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Please send results and invoice to the attention of _____ in our ☐ Baton Rouge, ☐ Lake Charles, ☐ Shreveport, ☐ Houston Office

WHITE COPY TO ACCOMPANY SAMPLE • RETAIN YELLOW COPY FOR FILES • RETAIN PINK COPY FOR FIELD SUPERVISOR

CX-100

July 1, 2016

Ms. Ellen Thomson
Anadarko Petroleum Corporation
1201 Lake Robbins Drive
The Woodlands, TX 77380
Ellen.Thomson@anadarko.com

HOUSTON, TX
PHONE (281) 397-9016
FAX (281) 397-6637

LAKE CHARLES, LA
PHONE (337) 625-6577
FAX (337) 625-6580

SHREVEPORT, LA
PHONE (318) 797-8636
FAX (318) 798-0478

**Re: Second Quarter 2016 Entrainment Monitoring Report for the Heidelberg Spar
Production Facility
CK Project No. 13096**

Dear Ms. Thomson:

CK Associates (CK) is providing this letter report to Anadarko Petroleum Corporation (Anadarko) to summarize the findings of the second quarter 2016 entrainment monitoring event for intake water collected from the cooling water intake structure (CWIS) aboard the Heidelberg Spar production facility (HSPF). The HSPF is a fixed facility, for which construction was commenced after July 17, 2006. Therefore, quarterly entrainment monitoring is required for the HSPF CWIS in accordance with section 12.c.2.ii of the *NPDES General Permit for New and Existing Sources and New Dischargers in the Offshore Subcategory of the Oil and Gas Extraction Point Source Category for the Western Portion of the Outer Continental Shelf of the Gulf of Mexico (GMG290000)* (general permit), effective October 1, 2012.

Sample Collection

Entrainment samples were collected by Anadarko personnel from a slip stream of the cooling water system. The slip stream begins downstream of the CWIS intake screens and upstream of the facility heat exchanger(s) and seawater basket strainers. The slip stream is passed through an entrainment monitoring device (EMD) consisting of a closed conduit with a 330 micrometer screen in line with the flow after which the stream is returned to the HSPF cooling water system downstream of the initial slip stream collection location.

The sampling process began at 0815 hours on June 9, 2016 and lasted until 0815 hours on June 10, 2016. The EMD was operated continuously during the sampling period (24 hours) at a flow rate of 14.0 gallons per minute resulting in an entrainment sample volume of 20,160 gallons. Sample collection data are summarized in Table 1. Upon sampling termination, the screen was removed from the EMD and washed of entrained particles into sample jars containing 10% buffered formalin. The sample jars were packed in an ice chest and shipped to CK for processing and species identification by a fisheries biologist. See attachments A and B for a copy of the field data sheet and chain of custody documentation respectively.

Sample Results

Samples were analyzed for the presence of eggs and larvae from yellowfin tuna, and red snapper. These species were identified as key representative commercial and recreational species of concern because eggs and larvae of these species are considered to be most likely to be entrained in the HSPF CWIS.

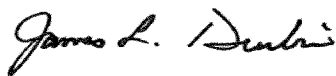
Zero yellowfin tuna eggs/larvae and zero red snapper eggs/larvae were identified during sample analysis. When normalized to the total facility flow, this entrainment rate amounts to zero eggs/larvae per cubic meter and zero key species of concern entrained per day. A summary of the entrained key species of concern is included in Table 2. In addition to any key species of concern identified, there were no ichthyoplankton observed in the sample, see Table 3. Other entrained organisms that were not listed as key species of concern and are not ichthyoplankton, but that were found in the entrainment samples included chaetognaths, copepods and polychaetes, see Table 4. None of these organisms should be included as part of the discharge monitoring report submittal because they do not represent key important commercial and recreational species of concern.

Conclusions

Zero organisms of key important commercial and recreational species of concern were identified in entrainment samples collected from the HSPF during its second calendar quarter of entrainment monitoring. Based on the analysis of the entrainment monitoring samples, engineering controls installed at the HSPF CWIS have successfully minimized the potential for environmental, socioeconomic, and ecological damage due to entrainment in the facility CWIS.

If you have any questions or comments regarding this report, please do not hesitate to contact me at (255) 755-1000 or via email at James.Durbin@c-ka.com.

Sincerely yours,
CK Associates



James L. Durbin
Senior Environmental Scientist

Attachments: As referenced

Table 1
Sample Collection Data Summary by Quarter

Quarter	Year	Start Date and Time	Stop Date and Time	Sample Flow Rate (gal/min)	Sample Volume (MG)	Collection Method
2	2016	06/9/16 0815	06/10/16 0815	14.0 (est)	0.020	Composite

Table 2
Entrainment Summary by Quarter
(Key Important Commercial and Recreational Species of Concern)

Quarter	Year	Species/Family	Total Collected Eggs	Total Collected Larvae	Sample Volume (MG)	Total # Eggs Entrained ¹	Total # Larvae Entrained ¹
1	2016	<i>Thunnus albacares</i> (yellowfin tuna)	0	0	0.20	0	0
		<i>Lutjanus campechanus</i> (red snapper)	0	0		0	0
2	2016	<i>Thunnus albacares</i> (yellowfin tuna)	0	0	0.020	0	0
		<i>Lutjanus campechanus</i> (red snapper)	0	0		0	0
Total	2016	<i>Thunnus albacares</i> (yellowfin tuna)	0	0	N/A	0	0
Total	2016	<i>Lutjanus campechanus</i>(red snapper)	0	0	N/A	0	0

¹ Projected number of organisms entrained per quarter based on an average cooling water flow equal to 26.8 MGD for a 91-day quarter

Table 3
Other Ichthyoplankton
(Non Key Commercial and Recreational Species of Concern)

Quarter	Year	Species/Family	Total Collected Eggs	Total Collected Larvae	Sample Volume (MG)	Total # Eggs Entrained ¹	Total # Larvae Entrained ¹
1	2016	N/A	0 0	0 0	0.20	0 0	0 0
2	2016	N/A	0 0	0 0	0.020	0 0	0 0
Total	2016	Eggs	0	0	N/A	0	0
Total	2016	Larvae	0	0	N/A	0	0

¹ Projected number of organisms entrained per quarter based on an average cooling water flow equal to 26.8 MGD for a 91-day quarter

Table 4
Other Non-Ichthyoplankton Entrained Organisms

Chaetognaths	Copepods	Polychaetes
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ATTACHMENT A
DATA SHEET FOR SAMPLE EVENT

ATTACHMENT A

Attachment C - Sampling Data Sheet

Cooling Water Intake Structure Entrainment Sampling Procedures

Anadarko Petroleum Corporation

Heidelberg Spar Production Facility

Collection Dates 6/9 - 6/10 / 2016

Name(s) of Personnel S. McElhany

Collecting Samples S. McElhany

Sample Event Start Time 0815; 6/9

Flow reading after 1 min 14 gallons

Sample Event End Time 0815; 6/10

Total Time Sampled 24 hrs

Sequential Sample Number HSPF - 2 QTR 2016

Number of Jars per Sample 4

Other Notes Relevant to
Sampling Event

ATTACHMENT B
CHAIN-OF-CUSTODY FOR SAMPLE EVENT



17170 PERKINS ROAD
BATON ROUGE, LA 70810
PHONE (225) 755-1000
FAX (225) 751-2010
<http://www.c-ka.com>

October 24, 2016

Ms. Ellen Thomson
Anadarko Petroleum Corporation
1201 Lake Robbins Drive
The Woodlands, TX 77380
Ellen.Thomson@anadarko.com

HOUSTON, TX
PHONE (281) 397-9016
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LAKE CHARLES, LA
PHONE (337) 625-6577
FAX (337) 625-6580

SHREVEPORT, LA
PHONE (318) 797-8636
FAX (318) 798-0478

**Re: Third Quarter 2016 Entrainment Monitoring Report for the Heidelberg Spar
Production Facility
CK Project No. 13096**

Dear Ms. Thomson:

CK Associates (CK) is providing this letter report to Anadarko Petroleum Corporation (Anadarko) to summarize the findings of the third quarter 2016 entrainment monitoring event for intake water collected from the cooling water intake structure (CWIS) aboard the Heidelberg Spar production facility (HSPF). The HSPF is a fixed facility, for which construction was commenced after July 17, 2006. Therefore, quarterly entrainment monitoring is required for the HSPF CWIS in accordance with section 12.c.2.ii of the *NPDES General Permit for New and Existing Sources and New Dischargers in the Offshore Subcategory of the Oil and Gas Extraction Point Source Category for the Western Portion of the Outer Continental Shelf of the Gulf of Mexico (GMG290000)* (general permit), effective October 1, 2012.

Sample Collection

Entrainment samples were collected by Anadarko personnel from a slip stream of the cooling water system. The slip stream begins downstream of the CWIS intake screens and upstream of the facility heat exchanger(s) and seawater basket strainers. The slip stream is passed through an entrainment monitoring device (EMD) consisting of a closed conduit with a 330 micrometer screen in line with the flow after which the stream is returned to the HSPF cooling water system downstream of the initial slip stream collection location.

The sampling process began at 1030 hours on September 23, 2016 and lasted until 1030 hours on September 24, 2016. The EMD was operated continuously during the sampling period (24 hours) at a flow rate of 4.0 gallons per minute resulting in an entrainment sample volume of 5,760 gallons. Sample collection data are summarized in Table 1. Upon sampling termination, the screen was removed from the EMD and washed of entrained particles into sample jars containing 10% buffered formalin. The sample jars were packed in an ice chest and shipped to CK for processing and species identification by a fisheries biologist. See attachments A and B for a copy of the field data sheet and chain of custody documentation respectively.

Sample Results

Samples were analyzed for the presence of eggs and larvae from yellowfin tuna, and red snapper. These species were identified as key representative commercial and recreational species of concern because eggs and larvae of these species are considered to be most likely to be entrained in the HSPF CWIS.

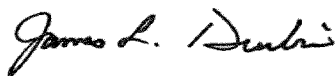
Zero yellowfin tuna eggs/larvae and zero red snapper eggs/larvae were identified during sample analysis. When normalized to the total facility flow, this entrainment rate amounts to zero eggs/larvae per cubic meter and zero key species of concern entrained per day. A summary of the entrained key species of concern is included in Table 2. In addition to any key species of concern identified, there were no ichthyoplankton observed in the sample, see Table 3. Other entrained organisms that were not listed as key species of concern and are not ichthyoplankton, but that were found in the entrainment samples included chaetognaths, copepods, polychaetes and ctenophores, see Table 4. None of these organisms should be included as part of the discharge monitoring report submittal because they do not represent key important commercial and recreational species of concern.

Conclusions

Zero organisms of key important commercial and recreational species of concern were identified in entrainment samples collected from the HSPF during its third calendar quarter of entrainment monitoring. Based on the analysis of the entrainment monitoring samples, engineering controls installed at the HSPF CWIS have successfully minimized the potential for environmental, socioeconomic, and ecological damage due to entrainment in the facility CWIS.

If you have any questions or comments regarding this report, please do not hesitate to contact me at (255) 755-1000 or via email at James.Durbin@c-ka.com.

Sincerely yours,
CK Associates



James L. Durbin
Senior Environmental Scientist

Attachments: As referenced

Table 1
Sample Collection Data Summary by Quarter

Quarter	Year	Start Date and Time	Stop Date and Time	Sample Flow Rate (gal/min)	Sample Volume (MG)	Collection Method
3	2016	09/23/16 1030	09/24/16 1030	4.0 (est)	0.006	Composite

Table 2
Entrainment Summary by Quarter
(Key Important Commercial and Recreational Species of Concern)

Quarter	Year	Species/Family	Total Collected Eggs	Total Collected Larvae	Sample Volume (MG)	Total # Eggs Entrained ¹	Total # Larvae Entrained ¹
1	2016	<i>Thunnus albacares</i> (yellowfin tuna)	0	0	0.20	0	0
		<i>Lutjanus campechanus</i> (red snapper)	0	0		0	0
2	2016	<i>Thunnus albacares</i> (yellowfin tuna)	0	0	0.020	0	0
		<i>Lutjanus campechanus</i> (red snapper)	0	0		0	0
3	2016	<i>Thunnus albacares</i> (yellowfin tuna)	0	0	0.006	0	0
		<i>Lutjanus campechanus</i> (red snapper)	0	0		0	0
Total	2016	<i>Thunnus albacares</i> (yellowfin tuna)	0	0	N/A	0	0
Total	2016	<i>Lutjanus campechanus</i>(red snapper)	0	0	N/A	0	0

¹ Projected number of organisms entrained per quarter based on an average cooling water flow equal to 26.8 MGD for a 91-day quarter

Table 3
Other Ichthyoplankton
(Non Key Commercial and Recreational Species of Concern)

Quarter	Year	Species/Family	Total Collected Eggs	Total Collected Larvae	Sample Volume (MG)	Total # Eggs Entrained ¹	Total # Larvae Entrained ¹
1	2016	N/A	0 0	0 0	0.20	0 0	0 0
2	2016	N/A	0 0	0 0	0.020	0 0	0 0
3	2016	N/A	0 0	0 0	0.006	0 0	0 0
Total	2016	Eggs	0	0	N/A	0	0
Total	2016	Larvae	0	0	N/A	0	0

¹ Projected number of organisms entrained per quarter based on an average cooling water flow equal to 26.8 MGD for a 91-day quarter

Table 4
Other Non-Ichthyoplankton Entrained Organisms

Chaetognaths	Copepods	Ctenophores	Polychaetes
--------------	----------	-------------	-------------

ATTACHMENT A
DATA SHEET FOR SAMPLE EVENT

Attachment C - Sampling Data Sheet
Cooling Water Intake Structure Entrainment Sampling Procedures
Anadarko Petroleum Corporation
Heidelberg Spar Production Facility

Collection Dates 9/23 - 9/24/2016

Name(s) of Personnel S. McElhany

Collecting Samples S. McElhany

Sample Event Start Time 1030; 9/23

Flow reading after 1 min ~~1030; 9/24~~ 4 gallons

Sample Event End Time 1030; 9/24

Total Time Sampled 24 hrs

Sequential Sample Number HSPF - 3QTR 2016

Number of Jars per Sample 4

Other Notes Relevant to
Sampling Event

ATTACHMENT B
CHAIN-OF-CUSTODY FOR SAMPLE EVENT



CHAIN OF CUSTODY AND ANALYTICAL REQUEST RECORD

Page ____ of ____

CLIENT: <u>Anadarko - HSPF</u>			P.O. NUMBER: <u>N/A</u>			SAMPLED BY: <u>S. McElhany</u>		
PROJECT NO.: <u>13096</u>			LABORATORY*: <u>CK</u>			DATE: <u>9/24/16</u>		
SAMPLE IDENTIFICATION	DATE	TIME	MATRIX	NO. OF CONTAINERS	PRESERVATIVE	ANALYSES AND INSTRUCTIONS		
HSPF-3QTR2016	9/24	1030	SW	4	10% formalin	Species composition & abundance of target species		
						HS16092401		
Relinquished by:	(Name) <u>Steven McElhany</u>	Date <u>9/26</u>	Time <u>10:46</u>	Received by:	(Name)	Date	Time	
	(Signature) <u>[Signature]</u>	Date	Time		(Signature)	Date	Time	
Relinquished by:	(Name)	Date	Time	Received by:	(Name)	Date	Time	
	(Signature)	Date	Time		(Signature)	Date	Time	
					<u>Gys Zieske</u>	<u>10.26.16</u>	<u>0700</u>	
					(Signature) <u>[Signature]</u>	Date <u>[Signature]</u>	Time <u>[Signature]</u>	
Method of Shipment: <u>Hot ship</u>		Condition of Samples upon receipt at laboratory: <u>Intact</u>				Temperature upon receipt <u>Ambient</u>		

Please send results and invoice to the attention of _____ in our ☐ Baton Rouge, ☐ Lake Charles, ☐ Shreveport, ☐ Houston Office

January 16, 2017

Ms. Ellen Thomson
Anadarko Petroleum Corporation
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SHREVEPORT, LA
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FAX (318) 798-0478

**Re: Fourth Quarter 2016 Entrainment Monitoring Report for the Heidelberg Spar
Production Facility
CK Project No. 13096**

Dear Ms. Thomson:

CK Associates (CK) is providing this letter report to Anadarko Petroleum Corporation (Anadarko) to summarize the findings of the fourth quarter 2016 entrainment monitoring event for intake water collected from the cooling water intake structure (CWIS) aboard the Heidelberg Spar production facility (HSPF). The HSPF is a fixed facility, for which construction was commenced after July 17, 2006. Therefore, quarterly entrainment monitoring is required for the HSPF CWIS in accordance with section 12.c.2.ii of the *NPDES General Permit for New and Existing Sources and New Dischargers in the Offshore Subcategory of the Oil and Gas Extraction Point Source Category for the Western Portion of the Outer Continental Shelf of the Gulf of Mexico (GMG290000)* (general permit), effective October 1, 2012.

Sample Collection

Entrainment samples were collected by Anadarko personnel from a slip stream of the cooling water system. The slip stream begins downstream of the CWIS intake screens and upstream of the facility heat exchanger(s) and seawater basket strainers. The slip stream is passed through an entrainment monitoring device (EMD) consisting of a closed conduit with a 330 micrometer screen in line with the flow after which the stream is returned to the HSPF cooling water system downstream of the initial slip stream collection location.

The sampling process began at 0925 hours on December 17, 2016 and lasted until 0925 hours on December 18, 2016. The EMD was operated continuously during the sampling period (24 hours) at a flow rate of 8.0 gallons per minute resulting in an entrainment sample volume of 11,520 gallons. Sample collection data are summarized in Table 1. Upon sampling termination, the screen was removed from the EMD and washed of entrained particles into sample jars containing 10% buffered formalin. The sample jars were packed in an ice chest and shipped to CK for processing and species identification by a fisheries biologist. See attachments A and B for a copy of the field data sheet and chain of custody documentation respectively.

Sample Results

Samples were analyzed for the presence of eggs and larvae from yellowfin tuna, and red snapper. These species were identified as key representative commercial and recreational species of concern because eggs and larvae of these species are considered to be most likely to be entrained in the HSPF CWIS.

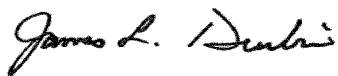
Zero yellowfin tuna eggs/larvae and zero red snapper eggs/larvae were identified during sample analysis. When normalized to the total facility flow, this entrainment rate amounts to zero eggs/larvae per cubic meter and zero key species of concern entrained per day. A summary of the entrained key species of concern is included in Table 2. There were no additional ichthyoplankton (eggs/larvae) observed in the sample see Table 3. Other entrained organisms that were not listed as key species of concern and are not ichthyoplankton, but that were found in the entrainment samples included Chaetognaths, copepods and pteropods, see Table 4. None of these organisms should be included as part of the discharge monitoring report submittal because they do not represent key important commercial and recreational species of concern.

Conclusions

Zero organisms of key important commercial and recreational species of concern were identified in entrainment samples collected from the HSPF during its fourth calendar quarter of entrainment monitoring. Based on the analysis of the entrainment monitoring samples, engineering controls installed at the HSPF CWIS have successfully minimized the potential for environmental, socioeconomic, and ecological damage due to entrainment in the facility CWIS.

If you have any questions or comments regarding this report, please do not hesitate to contact me at (255) 755-1000 or via email at James.Durbin@c-ka.com.

Sincerely yours,
CK Associates



James L. Durbin
Senior Environmental Scientist

Attachments: As referenced

Table 1
Sample Collection Data Summary by Quarter

Quarter	Year	Start Date and Time	Stop Date and Time	Sample Flow Rate (gal/min)	Sample Volume (MG)	Collection Method
4	2016	12/17/16 0925	12/18/16 0925	8.0 (est)	0.012	Composite

Table 2
Entrainment Summary by Quarter
(Key Important Commercial and Recreational Species of Concern)

Quarter	Year	Species/Family	Total Collected Eggs	Total Collected Larvae	Sample Volume (MG)	Total # Eggs Entrained ¹	Total # Larvae Entrained ¹
1	2016	<i>Thunnus albacares</i> (yellowfin tuna)	0	0	0.20	0	0
		<i>Lutjanus campechanus</i> (red snapper)	0	0		0	0
2	2016	<i>Thunnus albacares</i> (yellowfin tuna)	0	0	0.020	0	0
		<i>Lutjanus campechanus</i> (red snapper)	0	0		0	0
3	2016	<i>Thunnus albacares</i> (yellowfin tuna)	0	0	0.006	0	0
		<i>Lutjanus campechanus</i> (red snapper)	0	0		0	0
4	2016	<i>Thunnus albacares</i> (yellowfin tuna)	0	0	0.012	0	0
		<i>Lutjanus campechanus</i> (red snapper)	0	0		0	0
Total	2016	<i>Thunnus albacares</i> (yellowfin tuna)	0	0	N/A	0	0
Total	2016	<i>Lutjanus campechanus</i>(red snapper)	0	0	N/A	0	0

¹ Projected number of organisms entrained per quarter based on an average cooling water flow equal to 26.8 MGD for a 91-day quarter.

Table 3
Other Ichthyoplankton
(Non Key Commercial and Recreational Species of Concern)

Quarter	Year	Species/Family	Total Collected Eggs	Total Collected Larvae	Sample Volume (MG)	Total # Eggs Entrained ¹	Total # Larvae Entrained ¹
1	2016	N/A	0 0	0 0	0.20	0 0	0 0
2	2016	N/A	0 0	0 0	0.020	0 0	0 0
3	2016	N/A	0 0	0 0	0.006	0 0	0 0
4	2016	N/A	0 0	0 0	0.012	0 0	0 0
Total	2016	Eggs	0	0	N/A	0	0
Total	2016	Larvae	0	0	N/A	0	0

¹ Projected number of organisms entrained per quarter based on an average cooling water flow equal to 26.8 MGD for a 91-day quarter.

Table 4
Other Non-Ichthyoplankton Entrained Organisms

Chaetognaths	copepods	pteropods
--------------	----------	-----------

ATTACHMENT A
DATA SHEET FOR SAMPLE EVENT

Attachment C - Sampling Data Sheet
Cooling Water Intake Structure Entrainment Sampling Procedures
Anadarko Petroleum Corporation
Heidelberg Spar Production Facility

Collection Dates

12-17 - 12-18-2016

Name(s) of Personnel

N. Comeaux

Collecting Samples

Sample Event Start Time

9:25AM 12-17-2016

Flow reading after 1 min

8gpm

Sample Event End Time

9:25AM 12-18-2016

Total Time Sampled

24 hrs.

Sequential Sample Number

HSPF - 4QTR 2016

Number of Jars per Sample

4

Other Notes Relevant to
Sampling Event

None

ATTACHMENT B
CHAIN-OF-CUSTODY FOR SAMPLE EVENT



CHAIN OF CUSTODY AND ANALYTICAL REQUEST RECORD

Page ____ of ____

CLIENT: Anadarko - HSPF						P.O. NUMBER: NA		SAMPLED BY: N. Comeaux	
PROJECT NO.: 13096						LABORATORY*: CK		DATE: 12-18-16	

SAMPLE IDENTIFICATION	DATE	TIME	MATRIX	NO. OF CONTAINERS	PRESERVATIVE	ANALYSES AND INSTRUCTIONS
HSPF-4QTR2016	12-17-16 12-18-16	9:25 AM- 9:35 AM 9:25 PM	SW (Mitt)	4	10% Formalin	Species Composition and abundance of target species
						HS 16121801

Relinquished by:	(Name) Nicky Comeaux	Date 12-20-16	Time 8:08AM	Received by:	(Name) Sara Smith	Date 12-20-16	Time 8:08AM
	(Signature) <i>Nicky Comeaux</i>	Date 12-20-16	Time 8:08AM		(Signature) <i>[Signature]</i>	Date 12-20-16	Time 8:08AM
Relinquished by:	(Name) Tyler Ashire	Date 12/20/16	Time 1027 hr.	Received by Laboratory:	(Name) D.L. Sance	Date 12-20-16	Time 10:27
	(Signature) <i>Tyler Ashire</i>	Date 12/20/16	Time 1027 hr.		(Signature) <i>D.L. Sance</i>	Date 12-20-16	Time 10-27

Method of Shipment: HotShot	Condition of Samples upon receipt at laboratory: <i>Robert Walden</i> 12-20-16 @ 1730 ice	Temperature upon receipt
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Please send results and invoice to the attention of NA in our ☐ Baton Rouge, ☐ Lake Charles, ☐ Shreveport, ☐ Houston Office

WHITE COPY TO ACCOMPANY SAMPLE • RETAIN YELLOW COPY FOR FILES • RETAIN PINK COPY FOR FIELD SUPERVISOR

CK-100



17170 PERKINS ROAD
BATON ROUGE, LA 70810
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April 21, 2017

Ms. Sofia Lamon
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FAX (318) 798-0478

**Re: First Quarter 2017 Entrainment Monitoring Report for the Heidelberg Spar Production Facility
CK Project No. 13096**

Dear Ms. Lamon:

CK Associates (CK) is providing this letter report to Anadarko Petroleum Corporation (Anadarko) to summarize the findings of the first quarter 2017 entrainment monitoring event for intake water collected from the cooling water intake structure (CWIS) aboard the Heidelberg Spar production facility (HSPF). The HSPF is a fixed facility, for which construction was commenced after July 17, 2006. Therefore, quarterly entrainment monitoring is required for the HSPF CWIS in accordance with section 12.c.2.ii of the *NPDES General Permit for New and Existing Sources and New Dischargers in the Offshore Subcategory of the Oil and Gas Extraction Point Source Category for the Western Portion of the Outer Continental Shelf of the Gulf of Mexico (GMG290000)* (general permit), effective October 1, 2012.

Sample Collection

Entrainment samples were collected by Anadarko personnel from a slip stream of the cooling water system. The slip stream begins downstream of the CWIS intake screens and upstream of the facility heat exchanger(s) and seawater basket strainers. The slip stream is passed through an entrainment monitoring device (EMD) consisting of a closed conduit with a 330 micrometer screen in line with the flow after which the stream is returned to the HSPF cooling water system downstream of the initial slip stream collection location.

The sampling process began at 1316 hours on March 15, 2017 and lasted until 1317 hours on March 16, 2017. The EMD was operated continuously during the sampling period (24 hours) at a flow rate of 11.0 gallons per minute resulting in an entrainment sample volume of 15,840 gallons. Sample collection data are summarized in Table 1. Upon sampling termination, the screen was removed from the EMD and washed of entrained particles into sample jars containing 10% buffered formalin. The sample jars were packed in an ice chest and shipped to CK for processing and species identification by a fisheries biologist. See attachments A and B for a copy of the field data sheet and chain of custody documentation respectively.

Sample Results

Samples were analyzed for the presence of eggs and larvae from yellowfin tuna, and red snapper. These species were identified as key representative commercial and recreational species of concern because eggs and larvae of these species are considered to be most likely to be entrained in the HSPF CWIS.

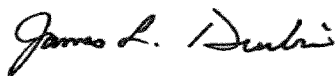
Zero yellowfin tuna eggs/larvae and zero red snapper eggs/larvae were identified during sample analysis. When normalized to the total facility flow, this entrainment rate amounts to zero eggs/larvae per cubic meter and zero key species of concern entrained per day. A summary of the entrained key species of concern is included in Table 2. There were no additional ichthyoplankton (eggs/larvae) observed in the sample see Table 3. Other entrained organisms that were not listed as key species of concern and are not ichthyoplankton, but that were found in the entrainment samples were Copepods, see Table 4. None of these organisms should be included as part of the discharge monitoring report submittal because they do not represent key important commercial and recreational species of concern.

Conclusions

Zero organisms of key important commercial and recreational species of concern were identified in entrainment samples collected from the HSPF during its first calendar quarter of entrainment monitoring for 2017. Based on the analysis of the entrainment monitoring samples, engineering controls installed at the HSPF CWIS have successfully minimized the potential for environmental, socioeconomic, and ecological damage due to entrainment in the facility CWIS.

If you have any questions or comments regarding this report, please do not hesitate to contact me at (255) 755-1000 or via email at James.Durbin@c-ka.com.

Sincerely yours,
CK Associates



James L. Durbin
Senior Environmental Scientist

Attachments: As referenced

Table 1
Sample Collection Data Summary by Quarter

Quarter	Year	Start Date and Time	Stop Date and Time	Sample Flow Rate (gal/min)	Sample Volume (MG)	Collection Method
1	2017	03/15/2017 1316	03/16/2017 1317	11.0 (est)	0.016	Composite

Table 2
Entrainment Summary by Quarter
(Key Important Commercial and Recreational Species of Concern)

Quarter	Year	Species/Family	Total Collected Eggs	Total Collected Larvae	Sample Volume (MG)	Total # Eggs Entrained ¹	Total # Larvae Entrained ¹
1	2017	<i>Thunnus albacares</i> (yellowfin tuna)	0	0	0.016	0	0
		<i>Lutjanus campechanus</i> (red snapper)	0	0		0	0
Total	2017	<i>Thunnus albacares</i> (yellowfin tuna)	0	0	N/A	0	0
Total	2017	<i>Lutjanus campechanus</i> (red snapper)	0	0	N/A	0	0

¹ Projected number of organisms entrained per quarter based on an average cooling water flow equal to 26.8 MGD for a 91-day quarter.

Table 3
Other Ichthyoplankton
(Non Key Commercial and Recreational Species of Concern)

Quarter	Year	Species/Family	Total Collected Eggs	Total Collected Larvae	Sample Volume (MG)	Total # Eggs Entrained ¹	Total # Larvae Entrained ¹
1	2017	N/A	0	0	0.016	0	0
			0	0		0	0
Total	2017	Eggs	0	0	N/A	0	0
Total	2017	Larvae	0	0	N/A	0	0

¹ Projected number of organisms entrained per quarter based on an average cooling water flow equal to 26.8 MGD for a 91-day quarter.

Table 4
Other Non-Ichthyoplankton Entrained Organisms

Organism	Total Number Collected
Copepods	6

ATTACHMENT A
DATA SHEET FOR SAMPLE EVENT

Attachment C - Sampling Data Sheet
Cooling Water Intake Structure Entrainment Sampling Procedures
Anadarko Petroleum Corporation
Heidelberg Spar Production Facility

Collection Dates

3/15/17

Name(s) of Personnel

A. Ochua

Collecting Samples

S. McElhany

Sample Event Start Time

1:16pm; 3/15/17

Flow reading after 1 min

11 gallons

Sample Event End Time

1:17pm; 3/16/17

Total Time Sampled

24 hours, 1 minute

Sequential Sample Number

Number of Jars per Sample

4

Other Notes Relevant to
Sampling Event

N/A

ATTACHMENT B
CHAIN-OF-CUSTODY FOR SAMPLE EVENT

**CHAIN OF CUSTODY
AND
ANALYTICAL REQUEST RECORD**

CLIENT: Anadarko-HSPF **P.O. NUMBER:** NA **SAMPLED BY:** A. Ochoa

PROJECT NO.: 13096 **LABORATORY*:** CK **DATE:** 3/16/17

SAMPLE IDENTIFICATION	DATE	TIME	MATRIX	NO. OF CONTAINERS	PRESERVATIVE	ANALYSES AND INSTRUCTIONS
HSPF-102017	3/16/17	1:54pm		4	10% Formalin	Species composition & abundance of target species
		1:17pm <u>Sun</u>				
						OK ID: HSI7032101

Relinquished by:	(Name) <u>Ariana Ochoa</u>	Date <u>3/16/17</u>	Time <u>1:54pm</u>	Received by:	(Name) <u>Courtney Talbot</u>	Date <u>3/21/17</u>	Time <u>1300</u>
	(Signature) <u>AOchoa</u>	Date <u>3/16/17</u>	Time <u>1:54pm</u>		(Signature) <u>Courtney Talbot</u>	Date <u>3/21/17</u>	Time <u>1300</u>
Relinquished by:	(Name) 	Date 	Time 	Received by Laboratory:	(Name) <u>TALAT FAROOQI</u>	Date <u>3/29/2017</u>	Time
	(Signature) 	Date 	Time 		(Signature) <u>Talant Farooqi</u>	Date <u>3/29/2017</u>	Time
Method of Shipment: <u>Fed EX</u>		Condition of Samples upon receipt at laboratory: <u>Sealed + preserved</u>				Temperature upon receipt 	

Please send results and invoice to the attention of NA in our ☐ Baton Rouge, ☐ Lake Charles, ☐ Shreveport, ☐ Houston Office



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May 5, 2017

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100 Northpark Blvd.
Covington, LA 70433
Attn: Jim Floyd
Jim.floyd@chevron.com

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FAX (337) 625-6580

SHREVEPORT, LA
PHONE (318) 797-8636
FAX (318) 798-0478

**Re: Second Quarter 2017 Entrainment Monitoring Report for the Chevron Jack and St. Malo Floating Production Unit
CK Project No. 10726**

Dear Mr. Floyd:

CK Associates (CK) is providing this letter report to Chevron USA (Chevron) to summarize the findings of the second quarter 2017 entrainment monitoring event for intake water collected from the cooling water intake structure (CWIS) aboard the Jack and St. Malo (JSM) floating production unit (FPU). The JSM FPU is a fixed facility, for which construction was commenced after July 17, 2006. Therefore, quarterly entrainment monitoring is required for the JSM FPU CWIS in accordance with section 12.c.2.ii of the *NPDES General Permit for New and Existing Sources and New Dischargers in the Offshore Subcategory of the Oil and Gas Extraction Point Source Category for the Western Portion of the Outer Continental Shelf of the Gulf of Mexico (GMG290000)* (general permit), effective October 1, 2012.

Sample Collection

Entrainment samples were collected by Chevron personnel from a slip stream of the cooling water system. The slip stream begins downstream of the CWIS intake screens and upstream of the facility heat exchanger(s). The slip stream is passed through an entrainment monitoring device (EMD) consisting of a closed conduit with a 330 micrometer screen in line with the flow after which the stream is returned to the JSM cooling water system downstream of the facility heat exchanger(s).

The sampling process began at 0700 hours on April 4, 2017 and lasted until 0700 hours on April 5, 2017. The EMD was operated continuously during the sampling period at a flow rate of 10.0 gallons per minute resulting in an entrainment sample volume of 14,400 gallons. Sample collection data are summarized in Table 1. Upon sampling termination, the screen was removed from the EMD and washed of entrained particles into sample jars containing 10% buffered formalin. The sample jars were packed in an ice chest and shipped to CK for processing and species identification by a fisheries biologist. See attachments A and B for a copy of the field data sheet and chain of custody documentation respectively.

Sample Results

Samples were analyzed for the presence of eggs and larvae from yellowfin tuna, and red snapper. These species were identified in the FPU's general permit application as key representative commercial and recreational species of concern because eggs and larvae of these species are considered to be most likely to be entrained in the JSM CWIS.

Zero yellowfin tuna eggs/larvae and zero red snapper eggs/larvae were identified during sample analysis. When normalized to the total facility flow, this entrainment rate amounts to zero eggs/larvae of key species of concern per cubic meter entrained per day. A summary of the entrained key species of concern is included in Table 2. There was an additional non-target ichthyoplankton larvae observed in the sample, see Table 3. One Microdesmidae, however the larvae was too damaged to identify further. There were no additional non-target ichthyoplankton eggs observed in the sample see Table 3. Other entrained organisms that were not listed as key species of concern and are not ichthyoplankton, but that were found in the entrainment samples included several Copepoda, see Table 4. None of these organisms should be included as part of the discharge monitoring report submittal because they do not represent key important commercial and recreational species of concern.

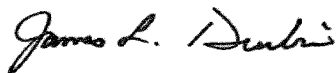
Conclusions

Zero organisms of key important commercial and recreational species of concern were identified in entrainment samples collected from the JSM FPU during its first calendar quarter of entrainment monitoring. Based on the analysis of the entrainment monitoring samples, engineering controls installed at the JSM FPU CWIS have successfully minimized the potential for environmental, socioeconomic, and ecological damage due to entrainment in the facility CWIS.

If you have any questions or comments regarding this report, please do not hesitate to contact me at (255) 755-1000 or via email at James.Durbin@c-ka.com.

Sincerely yours,

CK Associates



James L. Durbin

Senior Environmental Scientist

Attachments: As referenced

Table 1
Sample Collection Data Summary by Quarter

Quarter	Year	Start Date and Time	Stop Date and Time	Sample Flow Rate (gal/min)	Sample Volume (MG)	Collection Method
1	2017	01/5/17-2100	01/6/17-2100	20.0 (est)	0.029	Composite
2	2017	04/04/17-0700	04/05/17-0700	10.0 (est)	0.014	Composite

Table 2
Entrainment Summary by Quarter
(Key Important Commercial and Recreational Species of Concern)

Quarter	Year	Species/Family	Total Collected Eggs	Total Collected Larvae	Sample Volume (MG)	Total # Eggs Entrained ¹	Total # Larvae Entrained ¹
1	2017	<i>Thunnus albacares</i> (yellowfin tuna)	0	0	0.029	0	0
		<i>Lutjanus campechanus</i> (red snapper)	0	0		0	0
2	2017	<i>Thunnus albacares</i> (yellowfin tuna)	0	0	0.014	0	0
		<i>Lutjanus campechanus</i> (red snapper)	0	0		0	0
Total	2017	<i>Thunnus albacares</i> (yellowfin tuna)	0	0	N/A	0	0
Total	2017	<i>Lutjanus campechanus</i> (red snapper)	0	0	N/A	0	0

¹ Projected number of organisms entrained per quarter based on an average cooling water flow equal to 26.8 MGD for a 91-day quarter

Table 3
Other Ichthyoplankton
(Non Key Commercial and Recreational Species of Concern)

Quarter	Year	Species/Family	Total Collected Eggs	Total Collected Larvae	Sample Volume (MG)	Total # Eggs Entrained ¹	Total # Larvae Entrained ¹
1	2017	Gempylidae	0	1	0.029	0	84,097
		Haemulidae	0	3		0	252,290
		Sparidae	0	2		0	168,193
2	2017	Microdesmidae	0	1	0.014	0	174,200
Total	2017		0	7	N/A	0	678,780

¹ Projected number of organisms entrained per quarter based on an average cooling water flow equal to 26.8 MGD for a 91-day quarter

Table 4
Other Non-Ichthyoplankton Entrained Organisms

Copepoda

ATTACHMENT A
DATA SHEET FOR SAMPLE EVENT

Attachment A - Example Data Sheet
Cooling Water Intake Structure Entrainment Sampling and Monitoring Procedures
Chevron North America Exploration and Production Company Deepwater
Jack St. Malo Platform

Collection Date	4/5/2017
Project Number	10726
Names of Personnel Collecting Samples	Cedric Milton
Sample Collection Flow Rate	10GPM
Sample Event Start Time and Date	0700 4/4/17
Sample Event End Time and Date	0700 4/5/17
Weather Conditions during each cycle	Seas 4 to 6 Winds 10 to 12 Knots
Number of Sample Jars Filled	4
Sample Method	Entrainment

Other Notes Relevant to Sampling Event

<div></div>

ATTACHMENT B
CHAIN-OF-CUSTODY FOR SAMPLE EVENT

[illegible]

Relinquished: Courtney Abbott 4/24/17 @ 1145 Received: 1145-AM
Please send results and invoice to the attention of _____ in our ☐ Baton Rouge, ☐ Lake Charles, ☐ Shreveport, ☐ Houston Office

Memorandum

Environmental Resources Management

CityCentre Four
840 West Sam Houston
Parkway North, Suite 600
Houston, Texas 77024-3920
T: 281-600-1000
F: 281-520-4625

To: Ms. Sofia Lamon, Ms. Ellen Thomson

Company: Anadarko

From: Kurtis Schlicht, Bill Stephens, Emily Lantz

Date: 10 April 2015

Subject: Quarter 1 (January-March) 2015 Entrainment
Sampling Results



The Environmental Protection Agency (EPA) regulates discharges from exploration, development, and production facilities located in and discharging to federal waters of the Gulf of Mexico offshore of Louisiana and Texas under National Pollutant Discharge Elimination System (NPDES) General Permit number GMG 290000 (General Permit). The General Permit provides authorization to discharge wastewater and storm water in the western outer continental shelf (OCS) regions of the Gulf of Mexico with conditions that the permittee agrees to a variety of effluent limitations, monitoring, reporting, and cooling water intake structure (CWIS) requirements.

Samples were collected from the Lucius Truss Spar (Lucius) in accordance with the General Permit quarterly entrainment sampling requirements for Quarter 1 2015 (Q1 2015). A description of the sampling procedures and analytical results of the Q1 2015 event are presented in the following paragraphs

Procedure

ERM staff travelled to Lucius under Anadarko supervision on March 9, 2015. Sampling began at 00:00 on the morning of March 10, 2015. Samples were collected every six hours (06:00, 12:00, 18:00) until four 25 m³ entrainment sample volumes were collected representing a 24-hour sample period. Samples remained in the possession of the sample team during the transport to shore.

Once onshore, entrainment samples were shipped within 24 hours to Ecological Associates, Inc. (EAI), with chain-of-custody documentation included in the shipment. Samples were processed by EAI during a 45-60 day period.

In the laboratory, EAI technicians separated debris or material from aquatic organisms and sorted the organisms by life-stage to the lowest possible taxonomic level.

Memorandum

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Sampling Results

A total of 2,597 organisms were present in the 100m³ of water sampled. Of these organisms, 21 were fish and shellfish (also known as "Target" organisms, per EAI nomenclature): 2 fish larvae and 19 fish eggs. Table 1 below indicates the types, numbers, and lifestages of the fish within the March 10, 2015 sample. Table 2 below indicates the types, numbers, and lifestages of the non-fish species within the March 10, 2015 sample.

Table 1. Laboratory Analysis of Ichthyoplankton Samples Collected During Event 1 on March 10, 2015 at the Anadarko Lucius Truss Spar Platform: Target Organisms.

Taxa	CRI/Non-CRI Invertebrates	Lifestage	Sample 1	Sample 2	Sample 3	Sample 4	Total
Collection time			00:00	06:00	12:00	18:00	
Fish							
<i>Aulostomus maculatus</i>		Post Yolk-Sac Larvae		1			1
Unidentified fish - damaged		Post Yolk-Sac Larvae				1	1
Fish total				1		1	2
Fish Eggs							
Unidentified eggs - No embryos		Egg	3	3	1	12	19
Fish Eggs Total			3	3	1	12	19
Total Combined			3	4	1	13	21

*CRI = Commercially or Recreationally Important Decapod Crustaceans. None present in samples.

Memorandum

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Table 2. Laboratory Analysis of Ichthyoplankton Samples Collected During Event 1 on March 10, 2015 at the Anadarko Lucius Truss Spar Platform: Non-target Organisms.

Taxa	CRI/Non-CRI Invertebrates	Lifestage	Sample 1	Sample 2	Sample 3	Sample 4	Total
Collection time			00:00	06:00	12:00	18:00	
Crustaceans							
Amphipoda	Non-CRI	Other			1	1	2
<i>Portunus</i> sp.	Non-CRI	Megalops				1	1
Decapod shrimp	Non-CRI	Other	6	10	18	35	69
Crustacean Total			6	10	19	37	72
Decapods							
Pleocyemata	Non-CRI	Megalops			1	2	3
Pleocyemata	Non-CRI	Zoea			7		7
Decapods Total					8	2	10
Ostracods							
Ostracoda	Non-CRI	Other	87	149	182	187	605
Ostracods Total			87	149	182	187	605
Polychaetes							
Polychaeta	Non-CRI	Other	3	1	3	1	8
Polychaete Total			3	1	3	1	8
Arthropods							
Copepoda	Non-CRI	Other	244	380	533	705	1,862
Arthropod Total			244	380	533	705	1,862
Chaetognatha							
Chaetognatha	Non-CRI	Other	2	5	8	4	19
Chaetognatha Total			2	5	8	4	19
Total Combined			342	545	753	936	2576

Memorandum

Environmental Resources
Management

CityCentre Four
840 West Sam Houston
Parkway North, Suite 600
Houston, Texas 77024-3920

T: 281-600-1000
F: 281-520-4625

To: Ms. Sofia Lamon, Ms. Ellen Thomson

Company: Anadarko

From: Kurtis Schlicht, Bill Stephens, Emily Lantz

Date: 17 August 2015

Subject: Quarter 2 (April-June) 2015 Entrainment
Sampling Results



The Environmental Protection Agency (EPA) regulates discharges from exploration, development, and production facilities located in and discharging to federal waters of the Gulf of Mexico offshore of Louisiana and Texas under National Pollutant Discharge Elimination System (NPDES) General Permit number GMG 290000 (General Permit). The General Permit provides authorization to discharge wastewater and storm water in the western outer continental shelf (OCS) regions of the Gulf of Mexico with conditions that the permittee agrees to a variety of effluent limitations, monitoring, reporting, and cooling water intake structure (CWIS) requirements.

Samples were collected from the Lucius Truss Spar (Lucius) in accordance with the General Permit quarterly entrainment sampling requirements for Quarter 2 2015 (Q2 2015). A description of the sampling procedures and analytical results of the Q2 2015 event are presented in the following paragraphs

Procedure

ERM staff travelled to Lucius under Anadarko supervision on June 01, 2015. Sampling began at 00:00 on the morning of June 02, 2015. Samples were collected every six hours (06:00, 12:00, 18:00) until four 25 m³ entrainment sample volumes were collected representing a 24-hour sample period. Samples remained in the possession of the sample team during the transport to shore.

Once onshore, entrainment samples were shipped within 24 hours to Ecological Associates, Inc. (EAI), with chain-of-custody documentation included in the shipment. Samples were processed by EAI during a 45-60 day period.

In the laboratory, EAI technicians separated debris or material from aquatic organisms and sorted the organisms by life-stage to the lowest possible taxonomic level.

Memorandum

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Sampling Results

A total of 120 "Target" (per EAI nomenclature) fish or shellfish organisms were present in the 100m³ of water sampled: 2 fish larvae and 118 fish eggs. Table 1 below indicates the types, numbers, and lifestages of the fish within the June 02, 2015 sample.

Table 1. Laboratory Analysis of Ichthyoplankton Samples Collected During Event 1 on June 02, 2015 at the Anadarko Lucius Truss Spar Platform: Target Organisms.

Taxa	CRI/Non-CRI Invertebrates	Lifestage	Sample 1	Sample 2	Sample 3	Sample 4	Total
Collection time			00:00	06:00	12:00	18:00	
Fish							
<i>Carangidae</i>		Post Yolk-Sac Larvae	1	0	0	0	1
Unidentified fish - damaged		Post Yolk-Sac Larvae	1	0	0	0	1
Fish total			2	0	0	0	2
Fish Eggs							
Unidentified eggs - No embryos		Egg	0	115	3	0	118
Fish Eggs Total			0	115	3	0	118
Total Combined			2	115	3	0	120

*CRI = Commercially or Recreationally Important Decapod Crustaceans. None present in samples.

Memorandum

Environmental Resources Management

To: Ms. Sofia Lamon, Ms. Ellen Thomson

Company: Anadarko

From: Kurtis Schlicht, Emily Lantz

Date: 15 December 2015

Subject: Lucius Truss Spar - Quarter 3 (July-September) 2015
Entrainment
Monitoring Results

CityCentre Four
840 West Sam Houston
Parkway North, Suite 600
Houston, Texas 77024-3920

T: 281-600-1000
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The Environmental Protection Agency (EPA) regulates discharges from exploration, development, and production facilities located in and discharging to federal waters of the Gulf of Mexico offshore of Louisiana and Texas under National Pollutant Discharge Elimination System (NPDES) General Permit number GMG 290000 (General Permit). The General Permit provides authorization to discharge wastewater and storm water in the western outer continental shelf (OCS) regions of the Gulf of Mexico with conditions that the permittee agrees to a variety of effluent limitations, monitoring, reporting, and cooling water intake structure (CWIS) requirements.

Entrainment samples were collected from the Lucius Truss Spar (Lucius) in accordance with the General Permit quarterly entrainment monitoring requirements for Quarter 3 2015 (Q3 2015). A description of the sampling procedures and analytical results of the Q3 2015 monitoring event are presented in the following paragraphs.

Sampling Procedures

ERM staff travelled to Lucius under Anadarko supervision on September 21, 2015. Sampling began at 18:00 on the evening of September 21, 2015. Samples were collected every following six hours (00:00, 06:00, 12:00) until four, 25 m³ entrainment sample volumes were collected representing a 24-hour sample period. Sampling began at 18:00 in order to accommodate Lucius personnel request to have the entrainment sampling system (ESS) disassembled the day prior to crew change. Samples remained in the possession of the ERM sample team during the transport to shore, under the chain of custody protocol.

Once onshore, the entrainment samples were shipped within 24 hours to Ecological Associates, Inc. (EAI), with chain-of-custody documentation included in the shipment. Samples were processed by EAI during a 45-60 day period. The final results, dated December 11, 2015, were received via email on December 11, 2015.

Memorandum

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In the laboratory, EAI technicians separated debris or material from aquatic organisms and sorted the organisms by life-stage to the lowest possible taxonomic level. During this quarter, EAI composited the four samples into two samples: one composite to represent the samples taken during the daytime (12:00 and 18:00, sunset occurred around 19:30); and one composite to represent the samples taken during the nighttime (00:00 and 06:00, sunrise occurred around 07:15). In Q1 and Q2 the four samples collected each quarter were individually processed in order to verify the amount of material (number of organisms) present in the samples. After these two quarters were utilized as a baseline, we have assumed that the samples will contain relatively low numbers and organism density. In Q3 and future quarterly sampling events, the samples will be composited into two samples (as described above), which is sufficient to show diel migration of organisms for analysis.

Sampling Results

A total of 28 “target” (per EAI nomenclature) fish or shellfish organisms were present in the 100m³ of water sampled: 7 crustaceans; 3 fish larvae; and 18 fish eggs. Table 1 describes the types, numbers, and lifestages of the organisms of the 28 organisms present in the September 21, 2015 sample. Table 2 describes the lengths of captured fish organisms. Table 3 describes the density of organisms within the samples.

Table 1. Laboratory Analysis of Ichthyoplankton Samples Collected During Event 3 on September 21, 2015 at the Anadarko Lucius Truss Spar Platform.

Taxa	CRI*/Non-CRI Invertebrates	Lifestage	Nighttime Sample (00:00 and 06:00)	Daytime Sample (12:00 and 18:00)	Total
Crustaceans					
Penaeidae	CRI	Post Larvae	0	6	6
<i>Sicyonia</i> sp.	CRI	Mysis	0	1	1
Crustacean Total			0	7	7
Fish					
<i>Diplogrammus pauciradiatus</i>		Post Yolk-Sac Larvae	0	1	1
Unidentified fish - damaged		Post Yolk-Sac Larvae	2	0	2
Fish Total			2	1	3
Fish Eggs					
Unidentified eggs - No embryos		Egg	17	1	18
Fish Eggs Total			17	1	18
TOTAL			19	9	28

*CRI = Commercially or Recreationally Important Decapod Crustaceans.

Memorandum

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Table 2. Total Length (mm) of Ichthyoplankton Specimens Collected during Event 3 on September 21, 2015 at the Anadarko Lucius Truss Spar Platform.

Sample	Taxa	Life Stage	Specimen Number	Total Length (mm)
Nighttime Sample (00:00 and 06:00)	Unidentified fish-damaged	Post Yolk-Sac Larvae	1	N / A*
	Unidentified fish-damaged	Post Yolk-Sac Larvae	1	N / A*
Daytime Sample (12:00 and 18:00)	<i>Diplogrammus pauciradiatus</i>	Post Yolk-Sac Larvae	1	N / A*

* Specimen damaged, not measured.

Table 3. Densities (Number per m3 of Water Filtered) of Organisms Collected During Event 3 on September 21, 2015 at the Anadarko Lucius Truss Spar Platform.

Taxa	CRI*/Non-CRI Invertebrates	Lifestage	Nighttime Sample (00:00 and 06:00)	Daytime Sample (12:00 and 18:00)	Total
Volume of filtered water (m ³)			50.0	50.0	100.0
Crustaceans					
Penaeidae	CRI	Post Larvae	0	0.120	0.060
<i>Sicyonia</i> sp.	CRI	Mysis	0	0.020	0.010
Crustacean Total			0	0.140	0.070
Fish					
<i>Diplogrammus pauciradiatus</i>		Post Yolk-Sac Larvae	0	0.020	0.010
Unidentified fish - damaged		Post Yolk-Sac Larvae	0.040	0	0.020
Fish Total			0.040	0.020	0.030
Fish Eggs					
Unidentified eggs - No embryos		Egg	0.340	0.020	0.180
Fish Eggs Total			0.340	0.020	0.180
TOTAL			0.380	0.180	0.280

*CRI = Commercially or Recreationally Important Decapod Crustaceans.

Memorandum

Environmental Resources Management

To: Ms. Sofia Lamon, Ms. Ellen Thomson

Company: Anadarko

From: Kurtis Schlicht, Emily Lantz

Date: 19 January 2016

Subject: Lucius Truss Spar - Quarter 4 (October-December) 2015
Entrainment Monitoring Results

CityCentre Four
840 West Sam Houston
Parkway North, Suite 600
Houston, Texas 77024-3920

T: 281-600-1000
F: 281-520-4625



The Environmental Protection Agency (EPA) regulates discharges from exploration, development, and production facilities located in and discharging to federal waters of the Gulf of Mexico offshore of Louisiana and Texas under National Pollutant Discharge Elimination System (NPDES) General Permit number GMG 290000 (General Permit). The General Permit provides authorization to discharge wastewater and storm water in the western outer continental shelf (OCS) regions of the Gulf of Mexico with conditions that the permittee agrees to a variety of effluent limitations, monitoring, reporting, and cooling water intake structure (CWIS) requirements.

Entrainment samples were collected from the Lucius Truss Spar (Lucius) in accordance with the General Permit quarterly entrainment monitoring requirements for Quarter 4 2015 (Q4 2015). A description of the sampling procedures and analytical results of the Q4 2015 monitoring event are presented in the following paragraphs.

Sampling Procedures

ERM staff travelled to Lucius under Anadarko supervision on November 30, 2015. Sampling began at 18:00 on the evening of November 30, 2015, and ended at 12:00 on December 01, 2015. Samples were collected every following six hours (00:00, 06:00, 12:00) until four, 25 m³ entrainment sample volumes were collected representing a 24-hour sample period. Sampling began at 18:00 in order to accommodate Lucius personnel request to have the entrainment sampling system (ESS) disassembled the day prior to crew change. Samples remained in the possession of the ERM sample team during the transport to shore, under the chain of custody protocol.

Once onshore, the entrainment samples were shipped within 24 hours to Ecological Associates, Inc. (EAI), with chain-of-custody documentation included in the shipment. Samples were processed by EAI during a less than 30 day period. The final results, dated December 17, 2015, were received via email on December 17, 2015.

Memorandum

Page 2

In the laboratory, EAI technicians separated debris or material from aquatic organisms and sorted the organisms by life-stage to the lowest possible taxonomic level. Based on client feedback received from the third quarter 2015 monitoring results, EAI processed the four samples individually (similar to Q1 and Q2 samples), versus the Q3 2015 methodology that composited the four samples to results in two diel (daytime versus nighttime) samples. In Q4 and future quarterly sampling events, the samples will be processed individually rather than composited.

Sampling Results

A total of 27 “target” (per EAI nomenclature) fish or shellfish organisms were present in the 100m³ of water sampled: 16 crustaceans; 1 fish larvae; and 10 fish eggs. Table 1 describes the types, numbers, and lifestages of the organisms of the 27 organisms present in the November 30- December 01, 2015 sample. Table 2 describes the lengths of captured fish organisms. Table 3 describes the density of organisms within the samples.

TABLE 1 - Laboratory Analysis of Ichthyoplankton Samples Collected During Event 4 on November 30- December 01, 2015 at the Anadarko Lucius Truss Spar Platform.

Taxa	CRI*/Non-CRI Invertebrates	Lifestage	Sample 1	Sample 2	Sample 3	Sample 4	Total
Collection Time			18:00	00:00	06:00	12:00	
Crustaceans							
Euphausiacea	Non-CRI	Adult	0	2	0	0	2
Lophogastrida	Non-CRI	Adult	0	1	0	0	1
<i>Pinnotheres</i> spp.	Non-CRI	Megalops	3	0	0	0	3
<i>Rimopenaeus</i> spp.	CRI	Post Larvae	0	0	3	0	3
Sergestidae	Non-CRI	Adult	0	4	1	0	5
<i>Xiphopenaeus kroyeri</i>	CRI	Post Larvae	0	0	2	0	2
Crustacean Total			3	7	6	0	16
Fish							
Exocoetidae		Juvenile	0	0	1	0	1
Fish Total			0	0	1	0	1
Fish Eggs							
Unidentified eggs - No embryos		Egg	1	3	0	6	10
Fish Eggs Total			1	3	0	6	10
TOTAL			4	10	7	6	27

*CRI = Commercially or Recreationally Important Decapod Crustaceans.

Memorandum

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TABLE 2 - Total Length (mm) of Ichthyoplankton Specimens Collected during Event 4 on November 30- December 01, 2015 at the Anadarko Lucius Truss Spar Platform.

Sample	Taxa	Life Stage	Specimen Number	Total Length (mm)
Sample 1- 18:00	No Ichthyoplankton Present			
Sample 2- 00:00	No Ichthyoplankton Present			
Sample 3- 06:00	Exocoetidae	Juvenile	1	N / A*
Sample 4- 12:00	No Ichthyoplankton Present			

* Specimen damaged, not measured.

TABLE 3 - Densities (Number per m3 of Water Filtered) of Organisms Collected during Event 4 on November 30- December 01, 2015 at the Anadarko Lucius Truss Spar Platform.

Taxa	CRI*/Non-CRI Invertebrates	Lifestage	Sample 1	Sample 2	Sample 3	Sample 4	Total
Collection Time			18:00	00:00	06:00	12:00	
Volume of water filtered (m ³)			25	25	25	25	100
Crustaceans							
Euphausiacea	Non-CRI	Adult	0	0.08	0	0	0.02
Lophogastrida	Non-CRI	Adult	0	0.04	0	0	0.01
<i>Pinnotheres</i> spp.	Non-CRI	Megalops	0.12	0	0	0	0.03
<i>Rimapenaeus</i> spp.	CRI	Post Larvae	0	0	0.12	0	0.03
Sergestidae	Non-CRI	Adult	0	0.16	0.04	0	0.05
<i>Xiphopenaeus kroyeri</i>	CRI	Post Larvae	0	0	0.08	0	0.02
Crustacean Total			0.12	0.28	0.24	0	0.16
Fish							
Exocoetidae		Juvenile	0	0	0.04	0	0.01
Fish Total			0	0	0.04	0	0.01
Fish Eggs							
Unidentified eggs - No embryos		Egg	0.04	0.12	0	0.24	0.10
Fish Eggs Total			0.04	0.12	0	0.24	0.10
TOTAL			0.16	0.40	0.28	0.24	0.27

*CRI = Commercially or Recreationally Important Decapod Crustaceans.

Memorandum

Environmental Resources Management

To: Ms. Sofia Lamon, Ms. Ellen Thomson

Company: Anadarko

From: Bill Stephens

Date: 16 May 2016

Subject: Lucius Truss Spar - Quarter 1 (January-March) 2016
Entrainment Monitoring Results

CityCentre Four
840 West Sam Houston
Parkway North, Suite 600
Houston, Texas 77024-3920

T: 281-600-1000
F: 281-520-4625



The Environmental Protection Agency (EPA) regulates discharges from exploration, development, and production facilities located in and discharging to federal waters of the Gulf of Mexico offshore of Louisiana and Texas under National Pollutant Discharge Elimination System (NPDES) General Permit number GMG 290000 (General Permit). The General Permit provides authorization to discharge wastewater and storm water in the western outer continental shelf (OCS) regions of the Gulf of Mexico with conditions that the permittee agrees to a variety of effluent limitations, monitoring, reporting, and cooling water intake structure (CWIS) requirements.

Entrainment samples were collected from the Lucius Truss Spar (Lucius) in accordance with the General Permit quarterly entrainment monitoring requirements for Quarter 1 2016 (Q1 2016). A description of the sampling procedures and analytical results of the Q1 2016 monitoring event are presented in the following paragraphs.

Sampling Procedures

ERM staff travelled to Lucius under Anadarko supervision on February 15, 2016. Sampling began at 18:00 on the evening of February 15, 2016, and ended at 12:00 on February 16, 2016. Samples were collected every following six hours (00:00, 06:00, 12:00) until four, 25 m³ entrainment sample volumes were collected representing a 24-hour sample period. Sampling began at 18:00 in order to accommodate Lucius personnel request to have the entrainment sampling system (ESS) disassembled the day prior to crew change. Samples remained in the possession of the ERM sample team during the transport to shore, under the chain of custody protocol.

Once onshore, the entrainment samples were shipped within 24 hours to Ecological Associates, Inc. (EAI), with chain-of-custody documentation included in the shipment. Samples were processed by EAI during a less than 30 day period. The final results, dated March 7, 2016, were received via email on March 7, 2016.

Memorandum

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In the laboratory, EAI technicians separated debris or material from aquatic organisms and sorted the organisms by life-stage to the lowest possible taxonomic level. The four samples were processed individually (not composited).

Sampling Results

A total of 73 “target” (per EAI nomenclature) fish or shellfish organisms were present in the 100m³ of water sampled: 67 crustaceans; 4 fish larvae; and 2 fish eggs. Table 1 describes the types, numbers, and lifestages of the organisms of the 73 organisms present in the February 15-February 16, 2016 sample. Table 2 describes the lengths of captured fish organisms. Table 3 describes the density of organisms within the samples.

TABLE 1 - Laboratory Analysis of Ichthyoplankton Samples Collected During Event 5 on February 15-February 16, 2016 at the Anadarko Lucius Truss Spar Platform

Taxa	CRI/Non-CRI Invertebrates*	LifeStage	Lucius-021516-Sample 1	Lucius-021616-Sample 2	Lucius-021616-Sample 3	Lucius021616-Sample 4	Total
Collection Time			18:00	0:00	6:00	12:00	
Crustaceans							
Decapoda	Non-CRI	Post Larvae	7	2	2		11
Euphausiacea	Non-CRI	Post Larvae	13	8	19	9	49
<i>Hepatusepheliticus</i>	Non-CRI	Megalops			1		1
<i>Hexapanopeus</i>	Non-CRI	Megalops			1	1	2
<i>Litopenaeus</i> sp.	CRI	Post Larvae	1				1
<i>Portunus</i> sp.	Non-CRI	Megalops	1				1
<i>Solenocera</i> sp.	Non-CRI	Mysis	1				1
<i>Solenocera</i> sp.	Non-CRI	Post Larvae				1	1
Crustacean Total			23	10	23	11	67
Fish							
Unidentified fish		Post Yolk-Sac Larvae	1	1		2	4
Fish Total			1	1		2	4
Fish Eggs							
Unidentified eggs - No embryos		Egg		1		1	2
Fish Eggs Total				1		1	2
Total			24	12	23	14	73

*CRI = Commercially or Recreationally Important Decapod Crustaceans.

Memorandum

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TABLE 2 - Total Length (mm) of Ichthyoplankton Specimens Collected during Event 5 on February 15- 16, 2016 at the Anadarko Lucius Truss Spar Platform

Sample Number	Taxa	Life Stage	Specimen Number	Total Length (mm)
Lucius-021516-Sample 1	Unidentified Fish	Post Yolk-Sac Larvae	1	N / A ¹
Lucius-021616-Sample 2	Unidentified Fish	Post Yolk-Sac Larvae	1	N / A ¹
Lucius-021616-Sample 3	No Ichthyoplankton Present			
Lucius-021616-Sample 4	Unidentified Fish	Post Yolk-Sac Larvae	1	N / A ¹
	Unidentified Fish	Post Yolk-Sac Larvae	2	N / A ¹

¹ Specimen damaged, not measured.

TABLE 3 - Densities (Number per m³ of Water Filtered) of Organisms Collected During Event 5 on February 15-16, 2016 at the Anadarko Lucius Truss Spar Platform

Taxa	CRI/Non-CRI Invertebrates*	LifeStage	Lucius-021516-Sample 1	Lucius-021616-Sample 2	Lucius-021616-Sample 3	Lucius-021616-Sample 4	Total
Collection Time			18:00	0:00	6:00	12:00	
Volume of Water Filtered (m ³)			25.0	25.0	25.0	25.0	100.0
Crustaceans							
Decapoda	Non-CRI	Post Larvae	0.28	0.08	0.08		0.11
Euphausiacea	Non-CRI	Post Larvae	0.52	0.32	0.76	0.36	0.49
<i>Hepatus epheliticus</i>	Non-CRI	Megalops			0.04		0.01
<i>Hexapanopeus angustifrons</i>	Non-CRI	Megalops			0.04	0.04	0.02
<i>Litopenaeus</i> sp.	CRI	Post Larvae	0.04				0.01
<i>Portunus</i> sp.	Non-CRI	Megalops	0.04				0.01
<i>Solenocera</i> sp.	Non-CRI	Mysis	0.04				0.01
<i>Solenocera</i> sp.	Non-CRI	Post Larvae				0.04	0.01
Crustacean Total			0.92	0.4	0.92	0.44	0.67
Fish							
Unidentified fish		Post Yolk-Sac	0.04	0.04		0.08	0.04
Fish Total			0.04	0.04		0.08	0.04
Fish Eggs							
Unidentified eggs - No		Egg		0.04		0.04	0.02
Fish Eggs Total				0.04		0.04	0.02
Total			0.96	0.48	0.92	0.56	0.73

*CRI = Commercially or Recreationally Important Decapod Crustaceans.

Memorandum

Environmental Resources
Management

To: Ms. Sofia Lamon, Ms. Ellen Thomson

Company: Anadarko

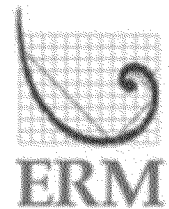
From: Bill Stephens

Date: 22 August 2016

Subject: Lucius Truss Spar - Quarter 2 (April-June) 2016
Entrainment Monitoring Results

CityCentre Four
840 West Sam Houston
Parkway North, Suite 600
Houston, Texas 77024-3920

T: 281-600-1000
F: 281-520-4625



The Environmental Protection Agency (EPA) regulates discharges from exploration, development, and production facilities located in and discharging to federal waters of the Gulf of Mexico offshore of Louisiana and Texas under National Pollutant Discharge Elimination System (NPDES) General Permit number GMG 290000 (General Permit). The General Permit provides authorization to discharge wastewater and storm water in the western outer continental shelf (OCS) regions of the Gulf of Mexico with conditions that the permittee agrees to a variety of effluent limitations, monitoring, reporting, and cooling water intake structure (CWIS) requirements.

Entrainment samples were collected from the Lucius Truss Spar (Lucius) in accordance with the General Permit quarterly entrainment monitoring requirements for Quarter 2 2016 (Q2 2016). A description of the sampling procedures and analytical results of the Q2 2016 monitoring event are presented in the following paragraphs.

Sampling Procedures

ERM staff travelled to Lucius under Anadarko supervision on June 13-14, 2016. Sampling began at 18:00 on the evening of June 13, 2016, and ended at 12:00 on June 14, 2016. Samples were collected every following six hours (00:00, 06:00, 12:00) until four, 25 m³ entrainment sample volumes were collected representing a 24-hour sample period. Sampling began at 18:00 to accommodate a Lucius personnel request to have the entrainment sampling system (ESS) disassembled the day prior to crew change. Samples remained in the possession of the ERM sample team during the transport to shore, under the chain of custody protocol.

Once onshore, the entrainment samples were shipped within 24 hours to Ecological Associates, Inc. (EAI), with chain-of-custody documentation included in the shipment. Samples were processed by EAI during a less than 30 day period. The final results, dated July 15, 2016, were received via email on July 15, 2016.

Memorandum

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In the laboratory, EAI technicians separated debris or material from aquatic organisms and sorted the organisms by life-stage to the lowest possible taxonomic level. The four samples were processed individually (not composited).

Sampling Results

A total of 11 “target” (per EAI nomenclature) fish or shellfish organisms were present in the 100m³ of water sampled: 6 crustaceans; 0 fish larvae; and 5 fish eggs. Table 1 describes the types, numbers, and lifestages of the organisms of the 11 organisms present in June 13- June 14, 2016 sample. Table 2 describes the lengths of captured fish organisms. Table 3 describes the density of organisms within the samples.

TABLE 1 - Laboratory Analysis of Ichthyoplankton Samples Collected During Event 6 on June 13 – June 14, 2016 at the Anadarko Lucius Truss Spar Platform

Taxa	CRI/Non-CRI Invertebrates*	LifeStage	Lucius-061316-Sample 1	Lucius-061416-Sample 2	Lucius-061416-Sample 3	Lucius061416-Sample 4	Total
Collection Time			18:00	0:00	6:00	12:00	
Crustaceans							
Decapoda	Non-CRI	Juvenile		1	1		2
Euphausiacea	Non-CRI	Juvenile		1	1		2
Euphausiacea	Non-CRI	Other	1			1	2
Crustacean Total			1	2	2	1	6
Fish							
Fish Total	No Ichthyoplankton Present						
Fish Eggs							
Unidentified eggs - No embryos		Egg	1	2	1	1	5
Fish Eggs Total			1	2	1	1	5
Total			2	4	2	2	11

*CRI = Commercially or Recreationally Important Decapod Crustaceans.

Memorandum

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TABLE 2 - Total Length (mm) of Ichthyoplankton Specimens Collected during Event 6 on June 13-14, 2016 at the Anadarko Lucius Truss Spar Platform

Sample Number	Taxa	Life Stage	Specimen Number	Total Length (mm)
Lucius-061316-Sample 1	No Ichthyoplankton Present			
Lucius-061416-Sample 2	No Ichthyoplankton Present			
Lucius-061416-Sample 3	No Ichthyoplankton Present			
Lucius-061416-Sample 4	No Ichthyoplankton Present			

¹ Specimen damaged, not measured.

TABLE 3 - Densities (Number per m³ of Water Filtered) of Organisms Collected During Event 6 on June 13-14, 2016 at the Anadarko Lucius Truss Spar Platform

Taxa	CRI/Non-CRI Invertebrates*	LifeStage	Lucius-061316-Sample 1	Lucius-061416-Sample 2	Lucius-061416-Sample 3	Lucius-061416-Sample 4	Total
Collection Time			18:00	0:00	6:00	12:00	
Volume of Water Filtered (m ³)			25.0	25.0	25.0	25.0	100.0
Crustaceans							
Decapoda	Non-CRI	Juvenile		0.04	0.04		0.02
Euphausiacea	Non-CRI	Juvenile		0.04	0.04		0.02
Euphausiacea	Non-CRI	Other	0.04			0.04	0.02
Crustacean Total			0.04	0.08	0.08	0.04	0.06
Fish							
Fish Total	No Ichthyoplankton Present						
Fish Eggs							
Unidentified eggs		Egg	0.04	0.08	0.04	0.04	0.05
Fish Eggs Total			0.04	0.08	0.04	0.04	0.05
Total			0.08	0.16	0.12	0.08	0.11

*CRI = Commercially or Recreationally Important Decapod Crustaceans.

Memorandum

Environmental Resources Management

To: Mr. John Geng and Mr. Steven McElhany

Company: Anadarko

From: Bill Stephens

Date: 24 February 2017

Subject: Lucius Truss Spar - Quarter 3 (July-September) 2016
Entrainment Monitoring Results

CityCentre Four
840 West Sam Houston
Parkway North, Suite 600
Houston, Texas 77024-3920

T: 281-600-1000
F: 281-520-4625



The Environmental Protection Agency (EPA) regulates discharges from exploration, development, and production facilities located in and discharging to federal waters of the Gulf of Mexico offshore of Louisiana and Texas under National Pollutant Discharge Elimination System (NPDES) General Permit number GMG 290000 (General Permit). The General Permit provides authorization to discharge wastewater and storm water in the western outer continental shelf (OCS) regions of the Gulf of Mexico with conditions that the permittee agrees to a variety of effluent limitations, monitoring, reporting, and cooling water intake structure (CWIS) requirements.

Entrainment samples were collected from the Lucius Truss Spar (Lucius) in accordance with the General Permit quarterly entrainment monitoring requirements for Quarter 3 2016 (Q3 2016). A description of the sampling procedures and analytical results of the Q3 2016 monitoring event are presented in the following paragraphs.

Sampling Procedures

ERM traveled to Lucius on September 19, 2016 to conduct a sample event. Sampling began at 18:00 hours on September 19, 2016 and after 15 minutes of sample run time, the sampling equipment exhibited a system failure and the sampling event was unable to be completed at that time. The sampling system was subsequently repaired and ERM staff travelled to Lucius on December 28, 2016 to conduct a make-up sample event for the previously uncompleted event. Sampling began at 18:00 hours on the evening of December 28, 2016, and ended at 12:00 hours on December 29, 2016. Samples were collected every following six hours (00:00, 06:00, 12:00) until four, 25 m³ entrainment sample volumes were collected representing a 24-hour sample period. Sampling began at 18:00 to accommodate a Lucius personnel request to have the entrainment sampling system (ESS) disassembled the day prior to crew change. Samples remained in the possession of the ERM sample team during the transport to shore, under the chain of custody protocol.

Once onshore, the entrainment samples were shipped within 24 hours to Ecological Associates, Inc. (EAI), with chain-of-custody documentation included in the shipment. Samples were processed by EAI during a less than 30 day period. The final results, dated February 2, 2017, were received via email on February 2, 2017.

Memorandum

Page 2

In the laboratory, EAI technicians separated debris or material from aquatic organisms and sorted the organisms by life-stage to the lowest possible taxonomic level. The four samples were processed individually (not composited).

Sampling Results

A total of 6 "target" (per EAI nomenclature) fish or shellfish organisms were present in the 100m³ of water sampled: 5 crustaceans; 1 fish larvae; and 0 fish eggs. Table 1 describes the types, numbers, and lifestages of the organisms of the 6 organisms present in December 28- December 29, 2016 sample. Table 2 describes the lengths of captured fish organisms. Table 3 describes the density of organisms within the samples.

TABLE 1 - Laboratory Analysis of Ichthyoplankton Samples Collected During Event 7 on December 28 – December 29, 2016 at the Anadarko Lucius Truss Spar Platform

Taxa	CRI/Non-CRI Invertebrates*	Life Stage	Lucius-Q3 122816 Sample 1	Lucius-Q3 122916 Sample 2	Lucius-Q3 122916 Sample 3	Lucius-Q3 122916 Sample 4	Total
Collection Time			18:00	0:00	6:00	12:00	
Crustaceans							
Caridea	Non-CRI	Other	2				2
Decapoda	Non-CRI	Other		2	1		3
Crustacean Total			2	2	1		5
Fish							
Unidentified fish-damaged		Post Yolk-Sac Larvae	1				1
Fish Total			1				1
Fish Eggs							
Fish Eggs Total	No eggs present						
Total			3	2	1		6

*CRI = Commercially or Recreationally Important Decapod Crustaceans.

Memorandum

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TABLE 2 - Total Length (mm) of Ichthyoplankton Specimens Collected during Event 7 on December 28-29, 2016 at the Anadarko Lucius Truss Spar Platform

Sample Number	Taxa	Life Stage	Specimen Number	Total Length (mm)
Lucius-Q3 122816-Sample 1	Unidentified fish-damaged	Post Yolk-Sac Larvae	1	NA
Lucius-Q3 122916-Sample 2	No Ichthyoplankton Present			
Lucius-Q3 122916-Sample 3	No Ichthyoplankton Present			
Lucius-Q3 122916-Sample 4	No Ichthyoplankton Present			

¹ Specimen damaged, not measured.

TABLE 3 - Densities (Number per m³ of Water Filtered) of Organisms Collected During Event 7 on December 28-29, 2016 at the Anadarko Lucius Truss Spar Platform

Taxa	CRI/Non-CRI Invertebrates	LifeStage	Lucius-Q3 122816-Sample 1	Lucius-Q3 122916-Sample2	Lucius-Q3 122916-Sample 3	Lucius-Q3 122916-Sample 4	Total
Collection Time			18:00	0:00	6:00	12:00	
Volume of Water Filtered (m ³)			25.0	25.0	25.0	25.0	100.0
Crustaceans							
Caridea	Non-CRI	Other	0.08				0.02
Decapoda	Non-CRI	Other		0.08	0.04		0.03
Crustacean Total			0.08	0.08	0.04		0.05
Fish							
Unidentified fish-damaged		Post Yolk – Sac Larvae	0.04				0.01
Fish Total			0.04				0.01
Fish Eggs							
Fish Eggs Total	No eggs present						
Total			0.12	0.08	0.04		0.06

*CRI = Commercially or Recreationally Important Decapod Crustaceans.

Memorandum

Environmental Resources
Management

To: Mr. John Geng and Mr. Steven McElhany

Company: Anadarko

From: Bill Stephens

Date: 24 February 2017

Subject: Lucius Truss Spar - Quarter 4 (October-December) 2016
Entrainment Monitoring Results

CityCentre Four
840 West Sam Houston
Parkway North, Suite 600
Houston, Texas 77024-3920

T: 281-600-1000
F: 281-520-4625



The Environmental Protection Agency (EPA) regulates discharges from exploration, development, and production facilities located in and discharging to federal waters of the Gulf of Mexico offshore of Louisiana and Texas under National Pollutant Discharge Elimination System (NPDES) General Permit number GMG 290000 (General Permit). The General Permit provides authorization to discharge wastewater and storm water in the western outer continental shelf (OCS) regions of the Gulf of Mexico with conditions that the permittee agrees to a variety of effluent limitations, monitoring, reporting, and cooling water intake structure (CWIS) requirements.

Entrainment samples were collected from the Lucius Truss Spar (Lucius) in accordance with the General Permit quarterly entrainment monitoring requirements for Quarter 4 2016 (Q4 2016). A description of the sampling procedures and analytical results of the Q4 2016 monitoring event are presented in the following paragraphs.

Sampling Procedures

ERM traveled to Lucius on December 28, 2016 to conduct a sample event. Sampling began at 12:00 hours on the evening of December 30, 2016, and ended at 06:00 hours on December 31, 2016. Samples were collected every following six hours (18:00, 00:00, 06:00) until four, 25 m³ entrainment sample volumes were collected representing a 24-hour sample period. Sampling began at 12:00 to allow a 24-hour period between the 3rd quarter make-up sample event and the regularly-scheduled 4th quarter sample event. The entrainment sampling system (ESS) was disassembled prior to crew change. Samples remained in the possession of the ERM sample team during the transport to shore, under the chain of custody protocol.

Once onshore, the entrainment samples were shipped within 24 hours to Ecological Associates, Inc. (EAI), with chain-of-custody documentation included in the shipment. Samples were processed by EAI during a less than 30 day period. The final results, dated February 2, 2017, were received via email on February 2, 2017.

Memorandum

Page 2

In the laboratory, EAI technicians separated debris or material from aquatic organisms and sorted the organisms by life-stage to the lowest possible taxonomic level. The four samples were processed individually (not composited).

Sampling Results

A total of 5 "target" (per EAI nomenclature) fish or shellfish organisms were present in the 100m³ of water sampled: 2 crustaceans; 2 fish larvae; and 1 fish egg. Table 1 describes the types, numbers, and lifestages of the organisms of the 5 organisms present in December 30- December, 31, 2016 sample. Table 2 describes the lengths of captured fish organisms. Table 3 describes the density of organisms within the samples.

TABLE 1 - Laboratory Analysis of Ichthyoplankton Samples Collected During Event 8 on December 30 – December 31, 2016 at the Anadarko Lucius Truss Spar Platform

Taxa	CRI/Non-CRI Invertebrates*	Life Stage	Lucius-Q4 123016 Sample 1	Lucius-Q4 123016 Sample 2	Lucius-Q4 123116 Sample 3	Lucius-Q4 123116 Sample 4	Total
Collection Time			12:00	18:00	00:00	06:00	
Crustaceans							
Euphausiacea	Non-CRI	Post Larvae				2	2
Crustacean Total						2	2
Fish							
Clupidae		Post Yolk-Sac Larvae		1			1
Syngnathidae		Post Yolk-Sac Larvae				1	1
Fish Total				1		1	2
Fish Eggs							
Unidentified eggs		Egg		1			
Fish Eggs Total							1
Total				2		3	5

*CRI = Commercially or Recreationally Important Decapod Crustaceans.

Memorandum

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TABLE 2 - Total Length (mm) of Ichthyoplankton Specimens Collected during Event 8 on December 30-31, 2016 at the Anadarko Lucius Truss Spar Platform

Sample Number	Taxa	Life Stage	Specimen Number	Total Length (mm)
Lucius-Q4 123016-Sample 1	No Ichthyoplankton Present			
Lucius-Q4 123016-Sample 2	Clupidae	Post Yolk-Sac Larvae	1	3.0
Lucius-Q4 123116-Sample 3	No Ichthyoplankton Present			
Lucius-Q4 123116- Sample 4	Syngnathidae	Post Yolk-Sac Larvae	1	3.0

TABLE 3 - Densities (Number per m³ of Water Filtered) of Organisms Collected During Event 8 on December 30-31, 2016 at the Anadarko Lucius Truss Spar Platform

Taxa	CRI/Non-CRI Invertebrates*	Life Stage	Lucius-Q4 123016 Sample 1	Lucius-Q4 123016 Sample 2	Lucius-Q4 123116 Sample 3	Lucius-Q4 123116 Sample 4	Total
Collection Time			12:00	18:00	00:00	06:00	
Volume of Water Filtered (m ³)			25.0	25.0	25.0	25.0	100.0
Crustaceans							
Euphausiacea	Non-CRI	Post Larvae				0.08	0.02
Crustacean Total						0.08	0.02
Fish							
Clupidae		Post Yolk-Sac Larvae		0.04			0.01
Syngnathidae		Post Yolk-Sac Larvae				0.04	0.01
Fish Total				0.04		0.04	0.02
Fish Eggs							
Unidentified eggs		Egg		0.04			0.01
Fish Eggs Total				0.04			0.01
Total				0.08		0.12	0.05

*CRI = Commercially or Recreationally Important Decapod Crustaceans.

Memorandum

Environmental Resources
Management

To: Mr. John Geng and Mr. Steven McElhany

Company: Anadarko

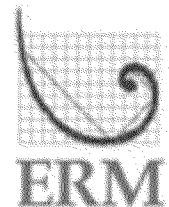
From: Bill Stephens

Date: 5 May 2017

Subject: Lucius Truss Spar - Quarter 1 (January-March) 2017
Entrainment Monitoring Results

CityCentre Four
840 West Sam Houston
Parkway North, Suite 600
Houston, Texas 77024-3920

T: 281-600-1000
F: 281-520-4625



The Environmental Protection Agency (EPA) regulates discharges from exploration, development, and production facilities located in and discharging to federal waters of the Gulf of Mexico offshore of Louisiana and Texas under National Pollutant Discharge Elimination System (NPDES) General Permit number GMG 290000 (General Permit). The General Permit provides authorization to discharge wastewater and storm water in the western outer continental shelf (OCS) regions of the Gulf of Mexico with conditions that the permittee agrees to a variety of effluent limitations, monitoring, reporting, and cooling water intake structure (CWIS) requirements.

Entrainment samples were collected from the Lucius Truss Spar (Lucius) in accordance with the General Permit quarterly entrainment monitoring requirements for Quarter 1 2017 (Q1 2017). A description of the sampling procedures and analytical results of the Q1 2017 monitoring event are presented in the following paragraphs.

Sampling Procedures

ERM traveled to Lucius on March 27, 2017 to conduct the 1st Quarter sample event. The contractor Dolphin supported the assembly of the entrainment sampling system (ESS). Sampling began at 18:00 hours on the evening of March 27, 2017, and was completed following the end of the 12:00 hour event on March 28, 2017. Samples were collected every following six hours (00:00, 06:00, 12:00) until four, 25 m³ entrainment sample volumes were collected representing a 24-hour sample period. The entrainment sampling system (ESS) was disassembled prior to crew change after the last event. Samples remained in the possession of the ERM sample team during the transport to shore, under the chain of custody protocol.

Once onshore, the entrainment samples were shipped within 24 hours to Ecological Associates, Inc. (EAI), with chain-of-custody documentation included in the shipment. Samples were processed by EAI during a less than 30 day period. The final results, dated April 10, 2017, were received via email on April 10, 2017.

Memorandum

Page 2

In the laboratory, EAI technicians separated debris or material from aquatic organisms and sorted the organisms by life-stage to the lowest possible taxonomic level. The four samples were processed individually (not composited).

Sampling Results

A total of 5 "target" (per EAI nomenclature) fish or shellfish organisms were present in the 100m³ of water sampled: 3 crustaceans; 2 fish larvae; and 0 fish eggs. Table 1 describes the types, numbers, and lifestages of the organisms of the 5 organisms present in March 27- March, 28, 2017 sample. Table 2 describes the lengths of captured fish organisms. Table 3 describes the density of organisms within the samples.

TABLE 1 - Laboratory Analysis of Ichthyoplankton Samples Collected During Event 9 on March 27 – March 28, 2017 at the Anadarko Lucius Truss Spar Platform

Taxa	CRI/Non-CRI Invertebrates*	Life Stage	Lucius-Q1 032717 Sample 1	Lucius-Q1 032817 Sample 2	Lucius-Q1 032817 Sample 3	Lucius-Q1 032817 Sample 4	Total
Collection Time			18:00	00:00	06:00	12:00	
Crustaceans							
Euphausiacea	Non-CRI	Metanauplius	2				2
Euphausiacea	Non-CRI	Adult			1		1
Crustacean Total			2		1		3
Fish							
Myctophidae		Post Yolk-Sac Larvae		1			1
Blenniidae		Yolk-Sac Larvae				1	1
Fish Total				1		1	2
Fish Eggs							
No fish eggs collected							
Fish Eggs Total							
Total			2	1	1	1	5

*CRI = Commercially or Recreationally Important Decapod Crustaceans.

Memorandum

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TABLE 2 - Total Length (mm) of Ichthyoplankton Specimens Collected during Event 9 on March 27-28, 2017 at the Anadarko Lucius Truss Spar Platform

Sample Number	Taxa	Life Stage	Specimen Number	Total Length (mm)
Lucius-Q1 032717-Sample 1	No Ichthyoplankton Present			
Lucius-Q1 032817-Sample 2	Myctophidae	Post Yolk-Sac Larvae	1	N / A ¹
Lucius-Q1 032817-Sample 3	No Ichthyoplankton Present			
Lucius-Q1 032817- Sample 4	Blenniidae	Yolk-Sac Larvae	1	2.5

¹Specimen damaged, not measured

TABLE 3 - Densities (Number per m³ of Water Filtered) of Organisms Collected During Event 9 on March 27-28, 2017 at the Anadarko Lucius Truss Spar Platform

Taxa	CRI/Non-CRI Invertebrates*	Life Stage	Lucius-Q1 032717 Sample 1	Lucius-Q1 032817 Sample 2	Lucius-Q1 032817 Sample 3	Lucius-Q1 032817 Sample 4	Total
Collection Time			18:00	00:00	06:00	12:00	
Volume of Water Filtered (m ³)			25.0	25.0	25.0	25.0	100.0
Crustaceans							
Euphausiacea	Non-CRI	Metanauplius	0.08				0.02
Euphausiacea	Non-CRI	Adult			0.04		0.01
Crustacean Total			0.08		0.04		0.03
Fish							
Myctophidae		Post Yolk-Sac Larvae		0.04			0.01
Blenniidae		Yolk-Sac Larvae				0.04	0.01
Fish Total				0.04		0.04	0.02
Fish Eggs							
No Fish Eggs Identified							
Fish Eggs Total							
Total			0.08	0.04	0.04	0.04	0.05

*CRI = Commercially or Recreationally Important Decapod Crustaceans.

APPENDIX F

COMMENT NO. 37

Meeting the Requirements of 40 CFR.125.137 For Information on Seasonal Variation of Entrainment

Relevant Text from 40CFR.125.137

“After that time[24 months of bimonthly monitoring] , the Director may approve a request for less frequent sampling in the remaining years of the permit term and when the permit is reissued, if supporting data show that less frequent monitoring would still allow for the detection of any seasonal variations in the species and numbers of individuals that are impinged or entrained.”

Proposed alternative to quarterly monitoring of a small number of regulated intakes

Approach

- Allow operators of regulated intakes to submit an initial report on seasonal densities of eggs and larvae from SEAMAP data base and follow up with updated reports periodically as data are added

Advantages

- Proposed approach is more effective at addressing regulatory requirement than existing method
- Data are collected and maintained over the long term
- Long term consistency of collection methods ensures comparability over time
- Data are suitable for detecting evolution of entrainment risk over time
- SEAMAP larval data could be selected for most common species in each region
- Approach is cost effective and appropriate to the low level of risk demonstrated in the 24-month Entrainment Monitoring Study and in a peer-reviewed study of entrainment risk from much larger water volumes in depths of 20-60 m where egg and larval densities are much higher.*

*Galloway, B.J., W.J. Gazey, J.G. Cole, and R.G. Fechhelm (2007); "Estimation of Potential Impacts from Offshore Liquefied Natural Gas Terminals On Red Snapper and Red Drum Fisheries of the Gulf of Mexico: An Alternative Approach" Transactions of the American Fisheries Society (2007) 136:655-677

Gulf of Mexico Fishery Zones

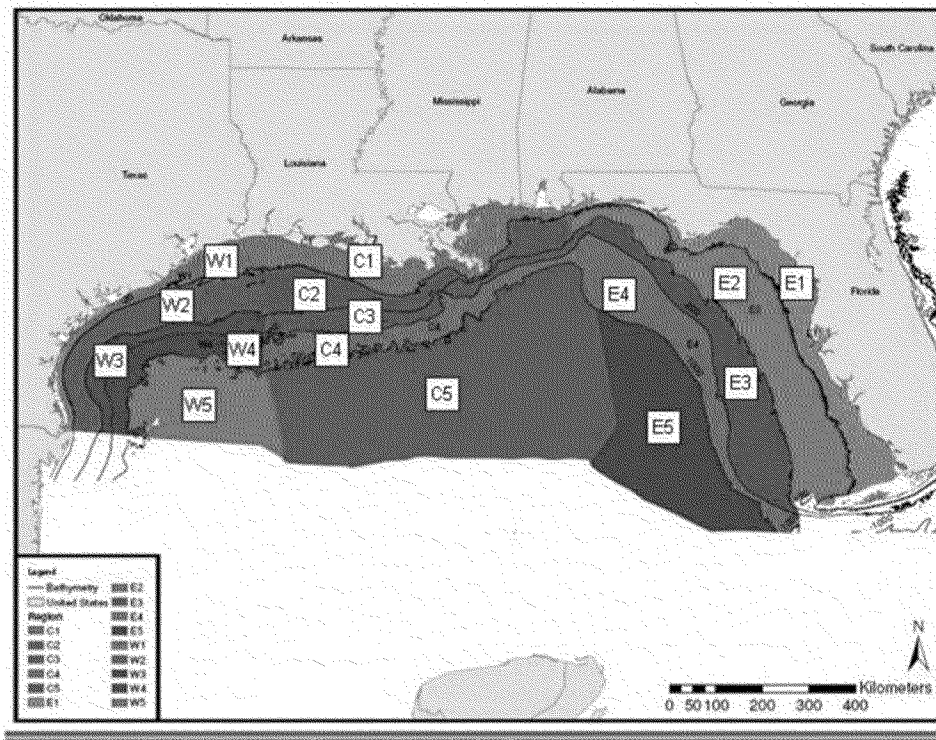
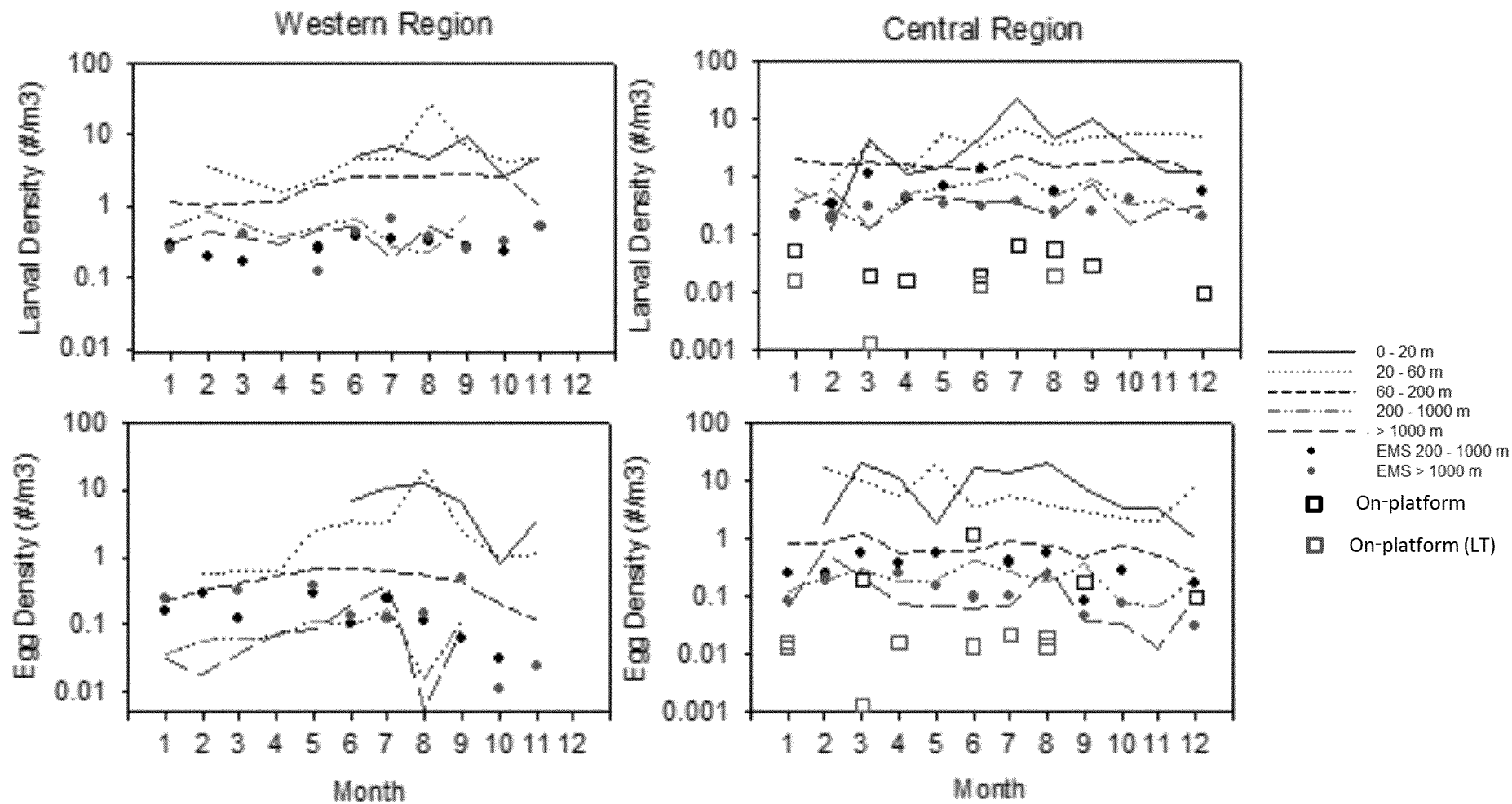


Figure E1. Zones for fishery data and water-use assessment.

- The Source Water Biological Baseline Characterization Study divided the GOM into 15 fishery zones organized by depth and longitude
- Each zone can be considered a homogenous unit for fishery analysis

Comparison of SEAMAP, EMS, and On-Platform Densities



*On--Platform (LT) means the values are "less than" the y-axis value. As an example, a 100 cubic meter sample in which there were no eggs found was plotted as having an egg density of less than 0.01 eggs/cubic meter.

Egg_and_larvae_multplots.jnb

APPENDIX G

COMMENT NO. 39

Issue

It is acknowledged that surfactants should not be used for purposes which "could circumvent the intent of the permit's produced water sheen monitoring requirements"(1).

Detergent vs Surfactant

It is important to differentiate between surfactants (detergents, dispersants) in the context of reducing oil content in a discharge stream vs the use of surface active substances in the formulation of chemicals to impart specific properties to the formulation. Detergents, dispersants, and soaps are surfactants or surfactant mixtures, whose solutions have cleaning properties (2). For example detergents alter interfacial properties so as to promote removal of a phase from solid surfaces (2). However, not all surfactants are detergents although their names are often used interchangeably. On the other hand, the cleaning ability of some surfactants is also required at some stages of the Petroleum Industry.

Use of Surfactants in the Oil Industry

Surfactants are used at all stages in the petroleum industry; from oil-well drilling and production, reservoir injection to surface plant processing, to pipeline and marine transportation of petroleum emulsions (2).

Surfactants are required in chemical formulations due to their unique property to break down the interface between water and oil and their ability to influence the properties of surfaces and interfaces (2). They are also defined as compounds that contain one part that has an affinity for polar media and the other has affinity for nonpolar media (3). They behave in this manner because they contain both a hydrophilic group, such as an acid anion ($-\text{CO}_2^-$ or SO_3^-), and a hydrophobic group such as an alkyl chain.

These qualities make surfactants invaluable to the petroleum industry. Their relevance in various interfacial phenomena, such as adsorbed surfactant films, self-assembly, contact angle, wetting, foams and emulsions with regard to drilling, enhanced oil recovery, antifoaming, corrosion inhibition, oil spill clean-up, oil/water separation, and fluidization of highly viscous materials has been well documented (3).

Use of Surfactants in Drilling Processes

The main applications of surfactants in oil based drilling fluids are emulsification and oil wetting of cuttings to ensure good suspension and transports. Emulsifiers have by definition surface active (surfactant) properties and they are an essential part of oil and synthetic based drilling fluids. The use of surfactants is at the core of invert emulsion technology from conventional mineral oil invert emulsion fluid system to high-performance organophilic clay-free synthetic based invert emulsion fluid system.

The function of the emulsifier is to lower the interfacial tension between oil and water resulting in the formation of a stable emulsion. This is achieved by having a mixture of oil and water in which one of the phases, the dispersed phase, occurs as droplets dispersed within the other (3). The emulsifier surrounds droplets of water as if encapsulating the water molecules, with the fatty acid component of the chemical dissolving in the oil phase of the mud. Emulsifiers used in drilling muds have been classified as primary and secondary; common primary emulsifiers include fatty acids, rosin acids and their derivatives, with secondary emulsifiers including amines, amides, sulphonic acids alcohols and related copolymers. The secondary emulsifiers improve the stability of the emulsion further from the primary or main emulsifier and aids.

Water based drilling fluids use a variety of surfactants (4) for specific applications such as lubrication and corrosion inhibition. Drilling lubricants often contain surfactants which are used to reduce friction during the drilling process and increase rate of penetration which is imperative for drilling long horizontal well depths. Without lubricants, some reservoir targets may not be reachable due to torque and drag limitations which lead to stuck pipe and possible well abandonment. These are especially important in applications using water or brine base fluids where there is minimal lubricity in comparison to oil based muds.

One common issue with water based drilling fluids when adding viscosifiers is the production of foam. The surfactants in defoamers (also known as anti-foamers) help reduce the interfacial tensions between fluid and air allowing the reduction in formed bubbles.

Other uses in water based drilling fluids include, inhibition of shale-swelling to prevent wellbore instabilities, prevention of cuttings sticking to the drill bit, prevention of differential sticking, inhibition of flocculation of clay particles and surfactant-polymer complexes for enhanced properties in fluids for low-pressure reservoirs.

Completion fluids are fluids used after the drilling process to complete the well before production begins. These fluids commonly consist of brine as the base fluid which is naturally corrosive. Therefore, it is common to use a corrosion inhibitor. Surfactants are now widely used in corrosion inhibitors by interacting with the metal surface. This is done by forming a film on the metal surface which in turn protects the metal through an absorption mechanism. Since completion brines are commonly used in the reservoir section, there is a need to ensure the brine/crude oil don't mix. Therefore, surfactants are commonly used to prevent emulsions from lowering the surface tension of the brine and interfacial tensions as previously explained.

Other surfactants are components in wellbore clean-up / cleaner chemicals for cleaning metal and/or formation surfaces both on surface and down hole.

Reservoir permeability (productivity or injectivity) can be severely adversely affected by drilling fluid and other residues coating metal surfaces. Surfactants are utilized to efficiently clean these metal surfaces of this debris and residue and therefore help protect the reservoir from damage.

A common down-hole usage is when displacing drilling fluids and other fluids from the well bore to clean metal surfaces downhole (e.g. production casing and tubing) and also for cleaning the marine riser at the end of the well, when the drilling and completion phase is finished. Occasionally, surfactants can be used to remove the drilling fluid filter cake from the face of the reservoir rock in order to re-establish optimal permeability pathways between the hydrocarbon reserves and the production tubing to surface.

At the surface, surfactants are used for cleaning of surface pits (tanks containing specialized fluids).

Summary

Surfactants are part of the composition of many chemicals and fluid systems used in the Gulf of Mexico. Toxicity tests in cuttings wastes containing both oil based muds and water based muds consistently meet the required limits, indicating that the presence of small concentration of these chemicals does not affect the toxicity of the discharge stream containing drilling fluids adhered to cuttings, as well as other fluids systems which may contain chemicals with surfactants in their make-up.

In summary chemicals with surfactant properties are currently used in the Gulf of Mexico and throughout the world in fluids systems which are discharged and meet regulatory requirements.

A complete ban in the discharge of surfactants would preclude the current discharge regime in the Gulf of Mexico.

References

- (1) Fact sheet and supplemental information for the proposed reissuance of the NPDES general permit or new and existing sources in the offshore subcategory of the oil and gas extraction point source category for the western portion of the outer continental shelf of the gulf of mexico (GMG290000); April 7, 2017
- (2) Surfactants. Fundamentals and Applications in the Petroleum Industry. L. Schramm edition 2000.
- (3) Surface Chemistry in the Petroleum Industry; James R. Kanicky, Juan-Carlos Lopez-Montilla, Samir Pandey and Dinesh O. Shah Chapter 11,
- (4) Optimization of Water-based Drilling Fluid Using Non-ionic and Anionic Surfactant Additives. Procedia Engineering Volume 148, 2016, Pages 1184-1190 Putri Yunitaa,*, Sonny Irawana, Dina Kaniab. Procedia Engineering 148 (2016) 1184 – 1190

APPENDIX H

COMMENT NO. 41

NeTDMR Inconsistencies

Storet Code	Limit Set	Parameter	DMR	Permit	
85871	CW	Visual Frequency	Weekly	Monthly	
85868 R 85868 S 85868 T		Velocity Frequency	Instantaneous	Daily	
TQM3E		Coefficient of Variation	48 HR MN MO AV MN	DA MAX Not in permit	
TQM6B			48 HR MN MO AV MN	DA MAX Not in permit	
04239 T		Visuals - Untreated	See MD DMR		
22414 51726 TOP3E TOP6B TPP3E TPP6B TXP3E TXP6B TYP3E TYP6B	SS	Toxicity Reporting Units	Percentage	mg/L	
TLP3E TGP3E TOP3E TPP3E TYP3E TXP3E TOP6B TPP6B TXP6B	HF	Mysid species name	None Shown	Mysidopsis bahia	(see TQP3E - mysid. Bahia) for consistency
			Americamysis bahia		
		Menidia species name	Menidia menidia	Menidia berryllina	(see TLP6B - Menidia for consistency)
TLP3E TGP3E TOP3E TPP3E TYP3E TXP3E TOP6B TPP6B TXP6B	PR	Mysid species name	None Shown	Mysidopsis bahia	(see TQP3E - mysid. Bahia) for consistency
			Americamysis bahia		
		Menidia species name	Menidia menidia	Menidia berryllina	(see TGP6B - Menidia for consistency)
22414 51726 TLP3E TGP3E TOP3E TPP3E TYP3E TXP3E TOP6B TPP6B TXP6B	MD	Whole effluent toxicity	percentage	mg/L	
		Critical Dilution	percentage	mg/L	
		Mysid species name	None Shown	Mysidopsis bahia	(see TQP3E - mysid. Bahia) for consistency
			Americamysis bahia		
		Menidia species name	Menidia menidia	Menidia berryllina	(see TGP6B - Menidia for consistency)

To: Pruitt, Scott[Pruitt.Scott@epa.gov]
From: Kakesh, Joseph
Sent: Thur 4/13/2017 7:28:53 PM
Subject: Letter to Administrator Pruitt from Dow AgroSciences LLC, ADAMA, and FMC Corporation
[Letter to Administrator Scott Pruitt 4-13-17.pdf](#)
[Administrator Pruitt 4-13-17 letter enclosure.pdf](#)
[Letter to Secretary Zinke 4-13-17.pdf](#)
[Letter to Secretary Ross 4-13-17.pdf](#)

Dear Administrator Pruitt:

Please see the attached letter and enclosures sent on behalf of Dow AgroSciences LLC, ADAMA, and FMC Corporation. Thank you.

Joe Kakesh

Joseph S. Kakesh | Attorney at Law
Wiley Rein LLP
1776 K Street NW | Washington, DC 20006
T: 202.719.7435 | M: 202.754.0794 | JKakesh@wileyrein.com
www.wileyrein.com | [Bio](#) | [LinkedIn](#) | [Twitter](#)

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To: Pruitt, Scott[Pruitt.Scott@epa.gov]
From: Research Assistant
Sent: Tue 6/6/2017 2:15:55 PM
Subject: Lead Renovation, Repair and Painting Regulation

Mr. Pruitt's Office,

I am a research assistant for a government relations consulting firm in Alexandria, VA. I am looking for any information towards the Lead Renovation, Repair and Painting Programs as it applies to Executive Order 13777: Enforcing Regulatory Reform Agenda. More specifically I am looking into the EPA's possible reform to restore a reasonable opt-out provision for homeowners without pregnant women and children under six living in the home.

If you have any information towards the status of this enforcement or possibly ways this can be accomplished, please let me know.

Best Wishes,

Zachary Totten
The Chwat Group
Research Assistant
(616) 490-2727

To: Pruitt, Scott[Pruitt.Scott@epa.gov]
From: Amy Uruburu
Sent: Thur 6/1/2017 10:41:17 PM
Subject: Public Input on Presidential Actions Related to Regulatory Reform - City of Solana Beach
EPA Director Letter.pdf

Good afternoon,

Attached please find a letter of public input on Presidential actions related to regulatory reform from the City of Solana Beach.

Please let me know if you have any questions.

Thank you,



Amy Uruburu

Administrative Assistant

City Manager's Office

City of Solana Beach

635 S. Highway 101

Solana Beach, CA 92075

Phone: (858) 720-2431



CITY OF SOLANA BEACH

www.cityofsolanabeach.org

635 SOUTH HIGHWAY 101 □ SOLANA BEACH, CA 92075 □ (858) 720-2400 □ Fax (858) 720-2455

June 1, 2017

Administrator Scott Pruitt
Environmental Protection Agency
Office of the Administrator 1101A
1200 Pennsylvania Avenue, N.W.
Washington, DC 20460

**SUBJECT: PUBLIC INPUT ON PRESIDENTIAL ACTIONS RELATED TO
REGULATORY REFORM**

Dear Administrator Pruitt:

The City of Solana Beach is submitting the following comments in response to your request for public input on Presidential Actions Related to Regulatory Reform.

As a community that prides itself as a leader in the stewardship of our natural environments, we are extremely concerned about recent actions taken by the administration to eliminate federal programs and policies that protect and preserve our planet's sustainability. In particular, we strongly object to activities that roll back U.S. climate policies, undermine the collection and dissemination of climate science and data, and withdraw the United States from the United Nations Framework Convention on Climate Change (UNFCCC) Paris Agreement. These actions not only endanger our natural resources, but they also jeopardize our vulnerable economy and threaten national security.

Recently, President Trump issued an Executive Order to review the Clean Power Plan, rescind several climate-related regulations and reports, reverse the moratorium on new mining leases on federal land, and overturn other climate-related federal activities. The order also revokes the President's Climate Action Plan, which called on the federal government to make "climate-resilient investments" through agency grants and technical assistance to local communities. Together, these actions completely abandon the United States' road map to achieving emissions reductions, and leave local communities vulnerable to the destructive impacts of climate change, including worsening air pollution, heat waves, poor water quality, coastal erosion, sea-level rise, wildfires, drought, and other devastation.

Solana Beach has taken action to protect our environment and combat the potential impacts of climate change. Specifically, the City has taken proactive measures such as becoming the first city in San Diego County to ban single-use plastic bags and polystyrene take-out containers. The City has proactively taken steps to reduce water consumption by utilizing drought tolerant and native landscaping in all City-projects and adopting a more stringent Water Efficient Model Landscape Ordinance for all qualifying development projects. Finally, the City has reduced energy use by retrofitting all City-owned streetlights with LED technology and implemented energy efficiency and conservation upgrades at all City facilities.

Climate change is one of the greatest threats to our planet and our nation, but can also be a catalyst for great economic opportunities. Employing more green infrastructure projects and low-impact development, increasing active transportation networks, creating more parks and open spaces, using alternative energy sources like solar and wind are just a few climate mitigation techniques that also create new economic opportunities, including local jobs.

We are also concerned about recent threats to withdraw the United States from the Paris Agreement on global climate change. This landmark accord would strengthen the global response to the threat of climate change and the ability of countries to deal with its devastating impacts. The United States should continue to honor its global commitment to the agreement and take every action possible to achieve its principles and goals. On a local level, the City of Solana Beach has been a longtime member of ICLEI -Local Governments for Sustainability and recently became a member of the Compact of Mayors, the world's largest coalition of city leaders addressing climate change.

We urge you, as the major federal official charged with protecting and preserving our natural resources, to change course and work to continue federal carbon reduction programs and regulations, fund scientific research and make it accessible to the American people, and honor the United States' commitment to the Paris Agreement. Thank you for this opportunity to provide comments on this critical issue.

Sincerely,

A handwritten signature in dark ink, appearing to read "Mike Nichols", with a long horizontal flourish extending to the right.

Mayor
City of Solana Beach

To: Pruitt, Scott[Pruitt.Scott@epa.gov]
From: Amy Uruburu
Sent: Thur 6/1/2017 11:32:41 PM
Subject: Public Input on Presidential Actions Related to Regulatory Reform and Paris Climate Agreement
EPA Director Pruitt Letter.pdf

Good afternoon Director Pruitt,

Attached please find a letter of input on Presidential actions related to regulatory reform and the withdrawal from the Paris Climate Agreement from the City of Solana Beach.

Thank you for your time,



Amy Uruburu

Administrative Assistant

City Manager's Office

City of Solana Beach

635 S. Highway 101

Solana Beach, CA 92075

Phone: (858) 720-2431



CITY OF SOLANA BEACH

www.cityofsolanabeach.org

635 SOUTH HIGHWAY 101 □ SOLANA BEACH, CA 92075 □ (858) 720-2400 □ Fax (858) 720-2455

June 1, 2017

Administrator Scott Pruitt
Environmental Protection Agency
Office of the Administrator 1101A
1200 Pennsylvania Avenue, N.W.
Washington, DC 20460

**SUBJECT: PUBLIC INPUT ON P RESIDENTIAL ACTIONS RELATED TO
REGULATORY REFORM**

Dear Administrator Pruitt:

The City of Solana Beach is submitting the following comments in response to your request for public input on Presidential Actions Related to Regulatory Reform.

As a community that prides itself as a leader in the stewardship of our natural environments, we are extremely concerned about recent actions taken by the administration to eliminate federal programs and policies that protect and preserve our planet's sustainability. In particular, we strongly object to the President's announcement today that he is withdrawing the United States from the United Nations Framework Convention on Climate Change (UNFCCC) Paris Agreement, which is just the latest of many similar activities that roll back U.S. climate policies, undermine the collection and dissemination of climate science and data and severely impact not only the environment but could also prevent significant employment opportunities for thousands of Americans in the rapidly expanding field of renewable energy. These actions not only endanger our natural resources, but they also jeopardize our vulnerable economy and threaten national security.

Recently, President Trump issued an Executive Order to review the Clean Power Plan, rescind several climate-related regulations and reports, reverse the moratorium on new mining leases on federal land, and overturn other climate-related federal activities. The order also revokes the President's Climate Action Plan, which called on the federal government to make "climate-resilient investments" through agency grants and technical assistance to local communities. Together, these actions completely abandon the United States' road map to achieving emissions reductions,

and leave local communities vulnerable to the destructive impacts of climate change, including worsening air pollution, heat waves, poor water quality, coastal erosion, sea level rise, wildfires, drought, and other devastation.

Solana Beach has taken action to protect our environment and combat the potential impacts of climate change. Specifically, the City has taken proactive measures such as becoming the first city in San Diego County to ban single-use plastic bags and polystyrene take-out containers. The City has proactively taken steps to reduce water consumption by utilizing drought tolerant and native landscaping in all City projects and adopting a more stringent Water Efficient Model Landscape Ordinance for all qualifying development projects. Finally, the City has reduced energy use by retrofitting all City-owned streetlights with LED technology and implemented energy efficiency and conservation upgrades at all City facilities.

Climate change is one of the greatest threats to our planet and our nation, but can also be a catalyst for great economic opportunities. Employing more green infrastructure projects and low-impact development, increasing active transportation networks, creating more parks and open spaces, using alternative energy sources like solar and wind are just a few climate mitigation techniques that also create new economic opportunities, including local jobs.

As noted above, we strongly object to the withdrawal of the United States from the Paris Agreement on global climate change. This landmark accord strengthens the global response to the threat of climate change and the ability of countries to deal with its devastating impacts. Since the President of the United States is apparently unwilling to honor our global commitment to the agreement, the EPA should take every action possible to achieve its principles and goals. On a local level, the City of Solana Beach has been a longtime member of ICLEI -Local Governments for Sustainability and recently became a member of the Compact of Mayors, the world's largest coalition of city leaders addressing climate change.

We urge you, as the major federal official charged with protecting and preserving our natural resources, to change course and work to continue federal carbon reduction programs and regulations, fund scientific research and make it accessible to the American people, and to honor the spirit of United States' prior commitment to the Paris Agreement. Thank you for this opportunity to provide comments on this critical issue.

Sincerely,

A handwritten signature in dark ink, appearing to read "Mike Nichols", followed by a horizontal line.

Mayor
City of Solana Beach

To: Pruitt, Scott[Pruitt.Scott@epa.gov]
From: Joan Schwan
Sent: Sun 5/21/2017 9:27:37 PM
Subject: Regulatory reform comments not properly recorded?

Hello Mr. Pruitt,

I submitted the comment below, and several others, through the EPA Docket regarding proposed "regulatory reform" on May 7. I do not see any of my comments when I search on the Docket now. Please let me know if my comments were incorporated into the public record, and if not, why not.

Thank you,

Joan Schwan

----- Original Message -----

Subject: Your Comment Submitted on Regulations.gov (ID: EPA-HQ-OA-2017-0190-0042)
Date: 2017-05-07 16:49
From: "Regulations.gov" <no-reply@regulations.gov>
To: jschwan@sonic.net



Please do not reply to this message. This email is from a notification only address that cannot accept incoming email.

Your comment was submitted successfully!

Comment Tracking Number: 1k1-8w9b-ddnn

Your comment may be viewable on Regulations.gov once the agency has reviewed it. This process is dependent on agency public submission policies/procedures and processing times. Use your tracking number to find out the status of your comment.

Agency: Environmental Protection Agency (EPA)
Document Type: Nonrulemaking
Title: Evaluation of Existing Regulations
Document ID: EPA-HQ-OA-2017-0190-0042

Comment:

We need stronger regulations, not weaker ones, and strong leadership to ensure that we and our children can survive and thrive as we change our planet in perilous ways. Strong regulations will help the US maintain a place of leadership in the world, and will support more and better jobs--rather than keeping us stuck in dying industries.

Stronger fuel efficiency regulations will help reduce our carbon emissions. We must support US car companies in developing more advanced fuel efficiency in order to maintain a role of leadership in the world's auto industry.

The Clean Power Plan is essential to help protect our planet's future. Supporting our renewable energy industry will be a major boost to US jobs, help keep US as a leader.

Methane regulations for landfills are essential to regulate a highly potent greenhouse gas.

The Clean Air Act must remain in place to ensure the Americans can lead healthy lives. The US should be leading the world in maintaining a beautiful, healthy environment, not going backwards while other countries like China take the lead.

Greenhouse gas emissions from large stationary sources should continue to be regulated--we need to help US industry move forward, not backward.

Uploaded File(s):

No files uploaded

For further information about the Regulations.gov commenting process, please visit

<https://www.regulations.gov/faqs>.

To: Pruitt, Scott[Pruitt.Scott@epa.gov]
Cc: Wagner, Kenneth[wagner.kenneth@epa.gov]; Stevens, Patrick K - DNR[Patrick.Stevens@wisconsin.gov]
From: Stepp, Cathy L - DNR
Sent: Wed 5/17/2017 9:00:55 PM
Subject: Response from WI DNR - Executive Order 13777
[FinalUSEECO 13777 Signed.pdf](#)
[FinalEPARegulations.gov Signed.pdf](#)

Good afternoon Administrator Pruitt,

Please find attached for your information two letters that were sent to the docket pertaining to Executive Order 13777 on Enforcing the Regulatory Agenda.

Thank you,

We are committed to service excellence.

Visit our survey at <http://dnr.wi.gov/customersurvey> to evaluate how I did.

Cathy Stepp
Secretary
Wisconsin Department of Natural Resources

101 S Webster Street

Madison, WI 53703
Phone: (608) 267-7556

Cathy.stepp@wisconsin.gov



To: Morris, Jeff[Morris.Jeff@epa.gov]
Cc: Cleland-Hamnett, Wendy[Cleland-Hamnett.Wendy@epa.gov]; Beck, Nancy[Beck.Nancy@epa.gov]; Pruitt, Scott[Pruitt.Scott@epa.gov]
From: Lynn L. Bergeson
Sent: Thur 8/10/2017 6:39:16 PM
Subject: Request for Continued Stay of Effective Date for Nano Reporting Rule
[00216691.pdf](#)

Hello Jeff:

The groups noted in the attached letter respectfully request that EPA continue to stay the effective date of the January 12, 2017, final rule, *Chemical Substances When Manufactured or Processed as Nanoscale Materials; TSCA Reporting and Recordkeeping Requirements*, which is now scheduled to expire on August 14, 2017, until six months from issuance of the promised guidance. We would be pleased to discuss this request with you if you would find that helpful.

Thank you for your consideration.

LYNN L. BERGESON

MANAGING PARTNER

BERGESON & CAMPBELL P C

2200 Pennsylvania Avenue, N.W. Suite 100W | Washington, D.C. 20037

T: 202-557-3801 | F: 202-557-3836 | M: 202-257-2872 | lawbc.com

To: Pruitt, Scott[Pruitt.Scott@epa.gov]
From: Gail E Rowley
Sent: Tue 5/16/2017 4:22:36 AM
Subject: My View on EPA Regulations & Importance - Please Read This, Thank You

From: Gail E Rowley
To:
EPA Administrator Scott Pruitt
Office of Policy Regulatory Reform
Mail Code 1803A
1200 Pennsylvania Ave NW
Washington, DC 20460

May 15, 2017

I tried to submit electronically to EPA Docket EPA-HQ-OA-2017-0190 via [regulations.gov](https://www.regulations.gov) at 11:15 pm - could not submit electronically

RE – Benefits of regulatory safeguards for human health and the environment in USA including Missouri's Jacks Fork & Current River Watersheds

Dear Administrator Pruitt,

I want the EPA to be strongly supported in maintaining, strengthening and continuing regulations that protect all our citizens. I hope you will read this whole letter. Environmental safeguards broadly benefit our health, safety and communities and are critical in protecting the water we all drink, the air we all breathe and the food we all eat. Any effort to roll back environmental protections would be a mistake with potentially horrendous repercussions. Please support the recognition of the great benefits that these vital and effective safeguards provide across the country and here in the Missouri Ozarks.

The Environmental Protection Agency (EPA) was created, and landmark laws like the Clean Water Act and Clean Air Act were passed, to protect people from unchecked pollution and to create a level playing field for industry by establishing minimum standards that have been subject to a rigorous and transparent public input process. As a result, we've made great improvement in cleaning up our waterways while also growing the economy. Yet, we still have far to go. Recent clean water crises in Toledo, Ohio, Flint, Michigan, and Charleston, West Virginia along with longstanding problems such as the Dead Zone in the Gulf of Mexico underscore the need to better protect our communities and critical resources from pollution. Moreover, it is often low-income communities who still lack access to clean and safe water and funding for water infrastructure.

Regulatory safeguards provide a range of benefits, but even when we look at economics alone it is clear that the benefits of regulations far outweigh the costs. In 2014 dollars, the benefits of major federal regulations were up to \$872 billion while the costs were up to \$110 billion. The net benefits of EPA regulations are particularly high. ***By 2020, the Clean Air Act, for example, will prevent over 230,000 early deaths, and the Clean Water Act is estimated to provide an economic benefit of \$11 billion per year.

In my area in south-central Missouri, a number of environmental regulations have helped all of us by providing much needed safeguards for all the people here — including safeguards for our water, our springs, streams and lakes. We still have major challenges here and we need the EPA's help in solving them. In addition, we have just had massive flooding that has made new historical records. My farm, like many others, has been greatly compromised but more importantly, we have had pollution from flood damage to many areas including waste treatment centers, propane and oil storage facilities, etc. We need our EPA's safety regulations and guidance to help in best methods of clean up AND in planning better ways to prevent such pollution in the future. We need you. We need a strong EPA to help us, not a weak one.

I and others are genuinely afraid that any weakening (or repealing—praying not so!) of regulations would reallocate the burdens of pollution to the public. Clean up costs would be paid by the public in dollars and the impacts would be reflected in lost lives/declining health, decreased property values, increased water treatment costs, degraded fisheries and

recreation opportunities, and stifled economic development. *Most Americans agree that strong and effective safeguards are not holding us back but instead provide the foundation for access to clean and safe water, land and air for all of us. In many states, these federal safeguards provide a much-needed minimum safety net for communities and waterways - this includes my state of Missouri.*

I urge you to listen to many people and diverse organizations and businesses nationwide who have benefitted from protections put in place by EPA. A little example where I live: Years ago, the EPA saved an Ozark valley from ongoing mistakes made by local road board members who didn't know what they were doing. Their misguided channelization of a major creek could have caused still worse flooding and larger problems for people accessing their farms, if the EPA had not stepped in when it did. There are countless examples of ways the EPA has helped communities be more healthy as well as more safe.

Please help make the EPA's inquiry focus instead on how to carry out the mission of the agency to better protect all people equally, and to protect and restore clean communities, rivers and streams in all states.

I am wishing you will make a stand for our safety and health. Please be a heroic maverick by protecting us now and into the future, by supporting the EPA becoming a *better protector (not a weaker protector)* - Be a hero to the people of our beloved nation!

Very Sincerely,

Gail E Rowley

Kingfisher Farm

497 Bartlett Dr

Willow Springs, MO 65793

To: Pruitt, Scott[Pruitt.Scott@epa.gov]
From: Bill LaMarr
Sent: Mon 5/15/2017 3:20:21 PM
Subject: COMMENTS ON EXECUTIVE ORDER 133777: ENFORCING THE REGULATORY REFORM AGENDA



DEDICATED TO ENVIRONMENTAL PROGRESS AND ECONOMIC GROWTH

May 13, 2017

Administrator Scott Pruitt
U. S. Environmental Protection Agency
Office of the Administrator, 1101A
1200 Pennsylvania Avenue, N.W.
Washington, DC 20460

Subject: Comments on Executive Order 133777: Enforcing the Regulatory Reform Agenda

Dear Administrator Pruitt:

Thank you for the opportunity to provide comments under Executive Order 13777 regarding specific U. S. Environmental Protection Agency (EPA) air and radiation actions that should be

modified to reduce their regulatory burden without reducing air quality protection. These comments are submitted on behalf of the **California Small Business Alliance**, a non-partisan coalition of California trade associations committed to providing small businesses with a single constructive voice before regional, state, and federal environmental regulatory agencies.

The challenges facing California's small businesses are enormous, as the legislature, courts, special interests, and environmental advocacy groups call for even stricter, and more costly regulations notwithstanding the enormous progress that has been accomplished in improving air quality and reducing risk to public health for more than fifty years. While there is still more to be done to improve air quality in our region, the nature of the challenge has materially shifted since many of the original Clean Air Act regulations were first adopted and implemented. Today, the major contributors to poor air quality, and the risks it presents to the public, are mobile sources (trucks, busses, automobiles, trains, planes, and ships) under the control of California Air Resources Board (ARB) and the EPA.

For decades, California's ARB and regional air quality management and air pollution control districts have promulgated seemingly endless volumes of increasingly more stringent rules and regulations on stationary sources (businesses). And most of these businesses have been and continue to be in the manufacturing sector.

Considering the resolve of the state's regulatory, political, judicial, special interest and environmental advocacy groups to reach some yet-to-be defined standard of air quality, Alliance members want to use this unique opportunity to offer some recommendations for EPA to earnestly considering reducing regulation and controlling regulatory costs, in accordance with EO 133777.

1. EPA should amend their rule or guidance on **Potential to Emit**. The federal regulations define "potential to emit" as: *the maximum capacity of a stationary source to emit a pollutant under its physical and operational design. Any physical or operational limitation on the capacity of the source to emit a pollutant, including air pollution control equipment and restrictions on hours of operation or on the type or amount of fuel combusted, stored, or processed, shall be treated as part of its design if the limitation or the effect it would have on emissions is federally enforceable.* (40 C.F.R Sections 52.21(b) (4), 51.165(a) (1) (iii), 51.166(b) (4).)

This standard has no basis in fact, and it makes California's ARB, and local air quality management and air pollution control districts, impose unrealistic emission reduction targets that translate into exorbitant compliance costs for struggling small businesses. For example, in the jurisdiction of California's South Coast Air Quality Management District (SCAQMD), "Potential to Emit" is generally defined as the maximum amount of emissions that can be generated from a device operating at maximum capacity, one hundred percent all the time, twenty-four hours per day, seven days a week. On an annualized basis that number would be multiplied by

365 days per year. Whereas this is a relatively simplistic approach to determining emissions, it is impossible for devices to operate under these conditions. They can only operate under these conditions for relatively short intervals when the equipment is first fired. The reason given by the SCAQMD is that all the devices in their source specific rules are based on a defined operating temperature, whereas temperatures fluctuate widely depending on many factors, including weather conditions and consumer demands for certain products and services.

The Alliance recommends that rather than being mandated to use “Potential to Emit,” rules and regulations should be based on actual emissions. And, this is not difficult to do with the metering and measuring technologies that are currently being used by all natural gas utilities. These range from smart meters giving real-time fuel usage to simple non-resettable timers on devices, that can limit the number of hours per day for a given BTU input, if the agency and facility owner agree it is necessary.

By using “Potential to Emit” as the basis for calculating emission reduction goals, EPA, together with state and local regulatory agencies are overestimating the reductions needed to reach our attainment goals. Moreover, this practice adds billions of dollars in unnecessary costs to businesses to comply with unnecessarily conservative rules which are based on what they might produce in the way of emissions rather than what they actually produce based on market demands.

This is a classic example of over-regulation, which if amended or eliminated, could greatly ease the compliance burden on small businesses without harming the environment.

2. **EPA, together with state and local air pollution control and air quality management districts, should amend the methodology and guidance for calculating “Cost Effectiveness.”** In the first place, **regulators should be removed from the process because they have a predisposition, or bias, to recognize only those costs which will support the rules and regulations that they have already committed to in federal or state implementation plans and/or local air quality management plans.**

The responsibility for calculating “cost effectiveness” should be transferred to the businesses being most affected by rules, regulations, and programs, or by recognized business or trade associations that represent multiple businesses in certain segments of industry (e.g. American Petroleum Institute, American Power Association, Printing Industries Association, National Association of Manufacturers, etc.). If peer review is believed to be necessary, then the findings or conclusions by these private entities should be evaluated by recognized economic or academic institutions.

At first glance, Alliance members see no precipitable difference in the funding required for this process. In California, regulated businesses pay fees for the services provided

by state and local air pollution control and air quality management districts. So, rather than budget for civil service employees to calculate “cost effectiveness,” budgets could be established to pay outside entities to perform this service. Adjustments could be made, if necessary.

3. Finally, Alliance members recommend that **EPA should establish a “look back” policy or guidance for all agencies.** The purpose would be to set standards for **measuring success or failure of certain control measures, rules, regulations, and programs** which are promulgated and proclaimed to achieve specific amounts of emissions reductions over time.

As an audit or quality assurance measure, Alliance members believe that **EPA and other lower-tier agencies should establish a schedule to “look back” or perform retrospective analyses on these emission reduction mechanisms to see if they have, in fact, accomplished their purpose.** Schedules could be set at 7 to 10 year intervals, for example. And, if they haven’t achieved their purpose, these control measures, rules, regulations, and programs should be immediately considered for revision and/or elimination.

Thank you for the opportunity to submit comments. We hope that our recommendations will be of assistance to you in developing

Bill La Marr

Bill La Marr

Executive Director

California Small Business Alliance

cc:

Honorable James E. Risch, Chair

U.S. Senate Committee on Small Business and Entrepreneurship

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To: Pruitt, Scott[Pruitt.Scott@epa.gov]; R8EISC[R8EISC@epa.gov]
Cc: Bryce Bird[bbird@utah.gov]; amatheson@utah.gov[amatheson@utah.gov]
From: Marina Thomas
Sent: Fri 6/30/2017 8:38:46 PM
Subject: EPA Docket No. EPA-R08-OAR-2015-0463 Utah Regional Haze: Utah's Request for Reconsideration
[DAQ-046-17 6-30-17 Utah Request for Reconsideration.pdf](#)

Dear Administrators Pruitt and Thomas:

Attached is the State of Utah's letter (with two attachments) requesting reconsideration of the Final Rule "Air Quality State Implementation Plans; Approvals and Promulgations: Utah; Revisions to Regional Haze State Implementation Plan; Federal Implementation Plan for Regional Haze," EPA Docket No. EPA-R08-OAR-2015-0463, 81 Fed. Reg. 43,894 (July 5, 2016). Hard copies will follow by certified mail. Thank you for your time and consideration.

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Bryce C. Bird
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DAQ-046-17

June 30, 2017

Via Certified Mail and Email

The Honorable Scott Pruitt
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U.S. Environmental Protection Agency
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1200 Pennsylvania Avenue, N.W.
Washington, DC 20460
Pruitt.scott@epa.gov

Deb Thomas
Region 8 Acting Administrator
U.S. Environmental Protection Agency
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Re: **EPA Docket No. EPA-R08-OAR-2015-0463**; Request for Reconsideration of the Final Rule Air Quality State Implementation Plans; Approvals and Promulgations: Utah; Revisions to Regional Haze State Implementation Plan; Federal Implementation Plan for Regional Haze

Dear Administrators Pruitt and Thomas:

The State of Utah (Utah) requests that EPA reconsider and revise the Final Rule¹ issued on July 5, 2016 partially disapproving Utah's regional haze state implementation plan (SIP) submitted to EPA on June 4, 2015. Specifically, EPA disapproved Utah's determination of the Best Available Retrofit Technology (BART) for NO_x (BART Alternative) and imposed a Federal Implementation

¹ See Approval, Disapproval and Promulgation of Air Quality Implementation Plans; Partial Approval and Partial Disapproval of Air Quality Implementation Plans and Federal Implementation Plan; Utah; Revisions to Regional Haze State Implementation Plan; Federal Implementation Plan for Regional Haze (Final Rule), 81 Fed. Reg. 43,894 (July 5, 2016).

Plan (FIP).² This is the decision that Utah now asks EPA to re-evaluate. Additionally, EPA did not act on Utah's October 20, 2015 submittal where Utah committed to address counting of certain emissions reductions from the Carbon plant closure under both the BART Alternative and the SO₂ backstop trading program.³ EPA did not act on this submittal because it disapproved the BART Alternative.⁴ Utah asks EPA to revisit this decision as well.

In the Final Rule, EPA acknowledged that "[t]he collection of information before EPA at the time of proposal presented a close call for [EPA] to decide whether to approve or disapprove the State's BART Alternative."⁵ EPA issued a dual proposal to approve or to disapprove the BART Alternative and requested "comment on all aspects of each proposal."⁶ EPA then issued the Final Rule, disapproving the BART Alternative based on EPA's evaluation of the submitted public comments and Utah's plan at the time.⁷ As Utah has made clear, the state believes EPA erred, and the record before the agency supported approval of the BART Alternative.⁸ Utah and others have challenged this action in court.⁹

This letter and the additional monitoring information described here provide additional support for Utah's position. This new data should inform EPA's "close call" decision and further tilt the scale toward approval of the BART Alternative. In this request for reconsideration, Utah also draws EPA's attention to certain metrics that EPA erroneously evaluated in the Final Rule and the way EPA performed the "weight-of-evidence" analysis to disapprove the Alternative. If EPA reevaluates and properly assigns weight to these metrics, the revised conclusions would also favor the BART Alternative.

EPA's Authority to Reconsider the Final Rule

The Tenth Circuit has long recognized the inherent authority of administrative agencies to reconsider their own decisions.¹⁰ Such authority is implicit in the agency's decision-making power "since the power to decide in the first instance carries with it the power to reconsider."¹¹ Exercise of this authority is especially appropriate where new evidence or additional information has been introduced to an agency.¹² Other circuit courts have echoed this principle, recognizing such

² See *id.* at 43,894.

³ See *id.* at 43,908, 43,921.

⁴ See *id.*

⁵ *Id.* at 43,895.

⁶ *Id.*

⁷ *Id.* at 43,896.

⁸ See generally Prelim. Br. of Pet'r State of Utah (Utah Br.), *Utah v. EPA et al.*, No. 16-9541 (10th Cir. Sept. 1, 2016).

⁹ See *Utah v. EPA*, No. 16-9541; *PacifiCorp v. EPA et al.*, No. 16-9542 (10th Cir. Sept. 2, 2016); *Utah Associated Mun. Power Sys. v. EPA et al.*, No. 16-9543 (10th Cir. Sept. 6, 2016); *Deseret Generation & Transmission Coop. v. EPA et al.*, No. 16-9545 (10th Cir. Sept. 6, 2016). These appeals have been consolidated with the case number 16-9541.

¹⁰ See e.g., *Trujillo v. Gen. Elec. Co.*, 621 F.2d 1084 (10th Cir. 1980) (finding it appropriate for EEOC to reconsider its own decision on employment discrimination, even though there was no explicit statute or regulation articulating the right to reconsider); *Rutherford v. United States*, 806 F.2d 1455 (10th Cir. 1986) (introduction of new evidence is an appropriate ground for an administrative agency to exercise its inherent authority to reconsider a decision, even if the decision is under judicial review).

¹¹ *Trujillo*, 621 F.2d at 1086.

¹² See *Rutherford*, 806 F.2d at 1460.

inherent authority as long as the decision to reconsider is not arbitrary, capricious, or an abuse of discretion and does not conflict with the agency's governing statute.¹³ Utah is, and will be, submitting new information supportive of the BART Alternative as described in detail below and requests that EPA exercise its inherent authority to reconsider its prior decision.

Besides the situations where an agency receives additional information or evidence post-decision, the courts acknowledge the agencies' ability to reconsider where there has been an "intervening event" that "may affect the validity of the agency action" or "draw [a] decision in question."¹⁴ Some of the recent executive pronouncements regarding environmental policy may call EPA's decision on the BART Alternative in question due to its excessive cost and questionable environmental benefit.¹⁵ In the Final Rule, EPA dismissed the cost difference between the BART Alternative and the FIP-imposed BART benchmark as irrelevant, which Utah maintains was legally incorrect.¹⁶ Regardless, this decision is now in conflict with the agency's current policy and thus merits reconsideration.

In addition to its inherent authority to reconsider, EPA can revisit its decision under the error correction provision in Section 110(k)(6) of the Clean Air Act.¹⁷ This process does not require submission of additional information by Utah but involves determination by EPA that it erred in "approving, disapproving, or promulgating any plan or plan revision (or part thereof)"¹⁸ EPA's determination of error and initiation of a reconsideration process under Section 110(k)(6) requires notice to the state and the public.¹⁹ Utah requests that EPA review its decision due to several errors, which Utah explains below.

Finally, EPA may resort to convening reconsideration proceedings under Section 307(d)(7)(B) of the Clean Air Act.²⁰ Even though Utah did not file a petition for reconsideration in this case, several industry parties with interests in the power plants subject to the Final Rule filed petitions to reconsider in September 2016, and those petitions are still pending before the Administrator.

¹³ See *ConocoPhillips Co. v. EPA*, 612 F.3d 822, 832 (5th Cir. 2010) (recognizing that the administrative agencies have inherent power to reconsider as long as the decision is not arbitrary, capricious, or an abuse of discretion and occurs within reasonable time); *Macktal v. Chao*, 286 F.3d 822, 825-26 (5th Cir. 2002) (finding that in the "absence of a specific statutory limitation, an administrative agency has the inherent authority to reconsider its decisions"); *Nat. Res. Def. Council v. Abraham*, 355 F.3d 179, 195 (2nd Cir. 2004) (limiting Department of Energy's inherent authority to reconsider its own rule due to the statutory provision circumscribing the agency's ability to do so).

¹⁴ *SKF USA Inc. v. United States*, 254 F.3d 1022, 1028-29 (Fed. Cir. 2001).

¹⁵ See e.g., Executive Order 13783 (March 28, 2017) ("It is also the policy of the United States that necessary and appropriate environmental regulations comply with the law, are of greater benefit than cost, when permissible, achieve environmental improvements for the American people"); Executive Order 13777 (Feb. 24, 2017) (directing the agencies to establish Regulatory Reform Task Force to identify regulations that "impose costs that exceed benefits").

¹⁶ See Utah Br. 43-44.

¹⁷ See 42 U.S.C. § 7410(k)(6).

¹⁸ *Id.*

¹⁹ See *id.*

²⁰ See *id.* § 7607(d)(7)(B).

New Information: Revised CALPUFF and CAMx Modeling

The CALPUFF modeling Utah submitted to EPA to support the BART Alternative used a default 1 ppb background ammonia level (as required by EPA's protocol), which did not consider seasonal variation in the background ammonia. Since then the National Park Service has collected almost three years of monitored data from the Canyonlands AMON monitor that measures gaseous ammonia.²¹ The sample is collected every two weeks, showing average levels of NH₄ for every two weeks from May 2014 until February of 2017.²² This data demonstrates consistent lower levels of gaseous ammonia in the winter and higher in the summer, with the average monthly gaseous ammonia reaching a maximum of 0.93 ppb in July and a minimum of 0.29 ppb in December.²³ This information at least raises questions about the accuracy of the previous modeling results where the 1 ppb background ammonia was used. Utah projects that more representative background ammonia levels may demonstrate preference for Utah's BART Alternative on the 98th percentile metric and is exploring ways to utilize AMON monitor data to rerun the CALPUFF model.

Additionally, Utah is planning to analyze the 20% most and 20% least impaired days using the CALPUFF model. This metric will cover a greater range of days and will also align with recent changes to federal regional haze regulations that require evaluation of impacts on these days for purposes of setting reasonable progress goals and measuring a state's progress towards those goals.²⁴ Utah believes this metric will provide additional support for the BART Alternative because it is closer in the considered range of days to the 90th percentile metric, which demonstrated that the Alternative was better than the BART benchmark.

Utah is also joining industry petitioners' efforts to do CAMx modeling. In its recent amendments to the Guideline on Air Quality Models,²⁵ EPA expressed a preference for photochemical grid models such as CAMx as "generally most appropriate for addressing ozone and secondary PM_{2.5} because they provide a spatially and temporally dynamic realistic chemical and physical environment for plume growth and chemical transformation."²⁶ In that same action, EPA removed CALPUFF as the preferred model for long-range transport assessment recognizing the availability of more appropriate modeling techniques i.e. photochemical grid models, which address limitations of models like CALPUFF.²⁷

The CAMx model is preferable for this case because it provides a more complete representation of emissions, chemistry, transport, and deposition, while CALPUFF focuses on the maximum impacts from a single facility with limited chemistry. In public comments and the current

²¹ This data is available at <http://nadp.sws.uiuc.edu/data/sites/siteDetails.aspx?net=AMON&id=UT09> (last visited June 30, 2017).

²² *Id.*

²³ See Canyonlands National Park Ammonia Data (2014-2017) attached to Co-owners' Request for Reconsideration Letter submitted concurrently with Utah's Request.

²⁴ See 81 Fed. Reg. 26,942, 26,955 (May 4, 2016) (proposed rule); 82 Fed. Reg. 3,078, 3,083-84 (Jan. 10, 2017). This is also consistent with the federal regulations at the time of the decision on the Final Rule. See 64 Fed. Reg. 35,714, 35,743 (July 1, 1999).

²⁵ See 82 Fed. Reg. 5,182 (Jan. 17, 2017).

²⁶ *Id.* at 5,194.

²⁷ *Id.* at 5,194-95.

litigation over the Final Rule, the industry parties have raised numerous issues regarding CALPUFF's deficiencies, including the limited chemistry problem and the large margin of error.²⁸

Evidence EPA did not Evaluate in the Final Rule

In evaluating the BART Alternative, EPA did not consider all the early emissions reductions resulting from the Alternative, and consequently did not assign sufficient weight to this fully favorable metric.²⁹ EPA only considered pre-2011 early emissions reductions, thus excluding reductions from controls installed at Hunter Unit 1 in 2014, closure of the Carbon plant in 2015, and ongoing reductions from 2012 to 2021 from all the existing controls and measures. These reductions are significant, resulting annually in a 11,925 tpy³⁰ decrease in haze-causing pollutants from the Carbon plant closure and a 2,473 tpy³¹ decrease from Hunter Unit 1 controls. If calculated over the entire period, including ongoing reductions until 2021, these reductions amount to approximately 17,000 tpy for Hunter Unit 1 and over 70,000 tpy for Carbon plant. Similarly, ongoing reductions from Hunter Units 2 and 3 and Huntington Units 1 and 2 from 2012 to 2021 add up to over 80,000 tpy of all haze-causing pollutants combined.³²

In the Final Rule, EPA explained that it relied on Utah's analysis which, in EPA's view, only considered 2006-2011 reductions.³³ To the contrary, Utah did not limit its review to 2006-2011 reductions but fully accounted for post-2011 reductions and the Carbon plant closure.³⁴ Utah asks EPA to review this determination and assign greater weight to the early emissions reductions metric that supports the BART Alternative.

The aggregate emission reductions under the Alternative is another metric that merits reconsideration. In the Final Rule, EPA found that combined greater reductions of PM, SO₂, and NO_x under the Alternative were "inconclusive" in supporting the Alternative and disagreed with Utah's analysis on this point.³⁵ However, extensive IMPROVE monitored data demonstrates greater visibility improvements from SO₂ reductions and smaller improvements from NO_x reductions.³⁶ In other words, SO₂ reductions are the most impactful on visibility and the Alternative provided for such reductions when EPA's FIP did not. Note also that in the Final Rule, EPA found that sulfate was the largest contributor to the regional haze and SO₂ reductions did provide year-round benefits.³⁷

²⁸ See EPA Docket No. EPA-R08-OAR-2015-0463, PacifiCorp's Comments, Attachment 3 (March 14, 2016); Prelim. Opening Br. of Pet'r PacifiCorp 69-73, *Utah v. EPA*, No. 16-9541 (March 17, 2017).

²⁹ See 81 Fed. Reg. at 43,900.

³⁰ This number is calculated by adding emissions of all the haze-causing pollutants that would be produced if Carbon continued to operate. See Staff Review 2008 PM BART Determination and Recommended Alternative to BART for NO_x (Staff Review) 10, Table 2, "Combined" column (May 13, 2015).

³¹ See *id.*

³² See *id.*

³³ See Staff Review 11.

³⁴ See *id.* 10, Table 2.

³⁵ See 81 Fed. Reg. at 43,898 (finding aggregate emissions reductions metric "inconclusive" and disregarding it in the "weight-of-evidence" analysis).

³⁶ See Staff Review 13.

³⁷ See 81 Fed. Reg. at 43,900.

Utah also requests that EPA reconsider its decision based on erroneous application of the “weight-of-evidence” test that resulted in disapproval of the Alternative. Specifically, EPA assigned arbitrary amounts of weight to certain metrics and ignored important metrics such as cost. Utah sees three errors in EPA’s application of the “weight-of-evidence” test. First, most of the weight was placed on the 98th percentile modeling metric as supportive of the BART benchmark, disregarding Utah’s analysis and explanation of the weaknesses of this metric. Utah assigned small weight to the 98th percentile metric because it projected visibility improvements on the most impaired winter days when the impacts of NO_x reductions were uncertain.³⁸ The projection was done using a CALPUFF model that did not account for impacts from wildfire, dust, and other stationary and mobile sources, which could be greater contributors to haze than ammonium nitrate on the most impaired days.³⁹ Second, marginal weight was assigned to several modeling metrics and IMPROVE monitoring data, resulting in only one metric—early emissions reductions—fully supportive of the Alternative under EPA’s analysis.⁴⁰ Even then, EPA did not consider all the early emissions reductions under this metric as explained above and did not assign sufficient weight to this metric. Third, EPA did not collectively weigh the supportive metrics and compare their combined weight against the 98th percentile metric that supported the BART benchmark. This error alone merits reconsideration.

In considering the metrics evaluated and submitted by Utah in support of the Alternative, EPA “place[d] little weight”⁴¹ on the IMPROVE data—an important real-world metric and not a projection—that informed Utah’s conclusion that the Alternative was better than the BART benchmark. This data demonstrated that SO₂ emissions reductions produced corresponding visibility benefits year-round, whereas NO_x emissions reductions did not show similar corresponding improvement in the high-nitrate winter months.⁴² Utah found this metric fully supportive of the Alternative because the Alternative, which provided greater SO₂ reductions than the BART benchmark, created year-round visibility improvements, including the high-visitation period of March through November at the nine Class I areas.⁴³

EPA erred in placing insufficient weight on this metric and should revisit its decision by considering seasonal visitation numbers and finding that the visibility benefits occurring year-round carry much more weight than uncertain⁴⁴ seasonal benefits that may occur from the FIP-imposed controls. Visitation data from National Park Service’s website for each of the Class I areas in this action, except for Flat Tops,⁴⁵ demonstrates that visitation numbers increase in

³⁸ See Staff Review 24-25.

³⁹ See *id.*

⁴⁰ See 81 Fed. Reg. at 43,901-02.

⁴¹ *Id.* at 43,900.

⁴² See Staff Review 13.

⁴³ See *id.* 10-12.

⁴⁴ While visibility improvements from the FIP are more likely to occur during the winter, these improvements are more uncertain in the winter than the improvements from SO₂ reductions due to interaction of the pollutants and temperatures. See Staff Review 13-16.

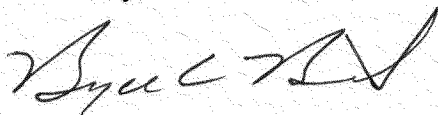
⁴⁵ Utah contacted U.S. Forest Service to inquire about visitation data for Flat Tops and learned that visitation data was not kept by the agency. There might have been manual surveys done for a day-long period via mail or otherwise in prior years but that information was not readily available.

March, peak in July-August and then decline in November.⁴⁶ In 2016, the numbers of visitors during November through February to the most popular area—Grand Canyon National Park—constituted only 17% of the total number of visitors during that year.⁴⁷ The percentages of winter visitors in 2016 are even smaller for the remaining areas, ranging from 13% for Zion and 6% for Mesa Verde.⁴⁸ EPA must consider this information and reweigh the metric.

Finally, Utah requests that EPA reevaluate its consideration of costs in light of new policy directives. In the Final Rule, EPA assigned no weight to cost, dismissing it as “irrelevant,”⁴⁹ where the difference between the BART Alternative and the BART benchmark (essentially the equivalent of EPA’s FIP) is at least \$700 million and the resulting projected visibility benefit from the benchmark is imperceptible to the human eye at only 0.14 deciviews. The new EPA administration is under presidential directive to “identify regulations that . . . impose costs that exceed benefits,”⁵⁰ and recommend “their repeal, replacement, or modification, consistent with applicable law.”⁵¹ EPA’s disapproval of the BART Alternative is a regulatory decision where cost clearly exceeds the benefits and must be reconsidered and replaced.

Utah appreciates EPA’s attention to this matter and requests EPA’s prompt action. Please do not hesitate to contact us if you have any questions or concerns.

Sincerely,



Bryce C. Bird, Director
Utah Division of Air Quality

⁴⁶ See Attachment 1, Recreation Visitors by Month for Arches, Black Canyon, Bryce Canyon, Canyonlands, Capitol Reef, Grand Canyon, Mesa Verde, and Zion, available at National Park Service Visitor Use Statistics, Park Reports, <https://irma.nps.gov/Stats/Reports/Park> (last visited June 30, 2017).

⁴⁷ See Attachment 2, Summary of Visits to Eight Class I Areas in 2016.

⁴⁸ See *id.*

⁴⁹ 81 Fed. Reg. at 43,897.

⁵⁰ Executive Order 13777, Section 3(d)(iii).

⁵¹ *Id.* Section 3(d).

Attachment 1

Recreation Visitors by Month for Eight Class I Areas

Park Arches NP

Add Color Ramp None

View Report

1 of 1

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Recreation Visitors by Month

Arches NP

Bookmark this report: [https://irma.nps.gov/Stats/SSRSReports/Park%20Specific%20Reports/Recreation%20Visitors%20By%20Month%20\(1979%20-%20Last%20Calendar%20Year\)](https://irma.nps.gov/Stats/SSRSReports/Park%20Specific%20Reports/Recreation%20Visitors%20By%20Month%20(1979%20-%20Last%20Calendar%20Year))

Year	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Total
2017	21,549	38,248	129,278	157,098	192,762								538,935
2016	20,311	33,200	119,122	151,112	201,718	211,706	210,359	188,340	200,906	146,250	69,404	33,290	1,585,718
2015	20,699	34,255	103,649	138,903	179,804	189,073	195,748	173,186	171,711	115,859	49,087	27,273	1,399,247
2014	17,038	22,559	89,841	122,186	165,379	170,286	169,844	173,416	165,222	115,545	46,940	26,511	1,284,767
2013	11,099	16,426	73,935	108,086	149,321	154,505	156,182	147,259	143,755	57,446	43,928	20,924	1,082,866
2012	14,961	17,870	72,273	103,800	142,876	143,482	145,696	139,036	139,801	96,310	36,170	18,302	1,070,577
2011	10,182	12,932	61,950	96,537	142,251	155,481	147,426	138,600	136,246	92,728	30,863	15,562	1,040,758
2010	8,713	11,746	57,623	93,999	135,670	151,209	145,489	139,304	138,442	89,929	29,343	12,938	1,014,405
2009	11,684	15,488	66,898	91,114	139,332	140,161	133,854	133,880	131,913	86,601	31,714	13,673	996,312
2008	9,095	13,435	66,408	83,695	133,195	124,451	121,038	129,843	124,268	80,194	29,604	13,569	928,795
2007	10,681	15,453	63,618	90,031	111,652	109,027	112,167	106,047	120,301	77,963	30,536	12,705	860,181
2006	12,841	20,728	67,550	84,244	110,564	102,061	101,297	107,176	112,335	72,615	28,087	13,551	833,049
2005	9,894	16,168	62,843	71,709	111,718	110,517	106,555	103,403	88,218	63,626	23,813	13,206	781,670
2004	11,571	11,378	58,919	79,069	113,248	94,638	93,569	83,585	95,276	58,743	21,208	11,927	733,131
2003	13,326	13,760	50,242	70,795	106,873	101,997	95,296	99,352	99,639	72,875	21,343	12,283	757,781
2002	9,951	18,163	57,348	76,544	109,130	101,051	96,566	97,631	98,581	67,373	23,134	14,200	769,672
2001	10,566	12,868	55,082	73,213	112,865	99,452	100,281	97,985	94,814	60,747	26,363	9,790	754,026
2000	11,505	14,435	52,392	77,012	107,856	106,198	110,434	104,487	104,706	65,675	19,787	11,942	786,429
1999	11,967	15,378	62,198	69,196	120,213	118,326	118,042	124,130	119,657	71,604	25,888	13,381	869,980
1998	10,450	12,337	52,467	75,236	119,525	116,384	113,040	120,361	116,137	68,808	21,875	10,541	837,161
1997	9,422	13,493	64,176	70,201	115,568	114,213	122,626	131,104	119,450	66,854	19,933	11,485	858,525
1996	8,183	14,300	58,978	79,685	116,552	111,616	119,378	128,102	121,734	63,804	19,972	13,712	856,016
1995	11,055	15,813	52,952	76,855	111,925	116,972	136,258	127,740	120,634	66,136	18,025	5,009	859,374
1994	9,904	12,348	53,504	74,096	103,871	98,464	109,497	115,008	110,027	61,676	16,776	12,007	777,178
1993	6,036	8,599	43,551	74,542	103,852	102,396	116,886	118,500	111,614	60,523	18,951	8,228	773,678
1992	8,016	12,779	50,228	82,025	104,639	109,882	119,021	124,840	104,561	58,839	18,150	6,851	799,831
1991	6,307	11,453	45,466	60,081	93,762	104,120	103,591	116,516	90,407	51,260	14,808	8,111	705,882
1990	6,440	8,444	42,372	71,479	84,912	90,154	84,017	97,265	72,310	40,923	15,192	7,211	620,719
1989	4,687	5,683	41,135	51,807	75,599	80,321	78,010	88,731	69,361	37,592	15,113	7,770	555,809
1988	4,145	6,674	31,382	45,863	68,712	79,183	77,160	80,219	75,694	34,808	11,253	5,362	520,455
1987	6,015	6,957	22,167	43,965	63,510	69,019	71,987	80,492	60,969	28,961	9,904	4,970	468,916
1986	7,070	6,762	33,700	36,042	53,931	62,158	63,528	68,397	49,456	23,414	8,425	6,561	419,444
1985	4,727	4,944	18,033	36,032	50,174	56,588	54,484	61,538	44,554	21,037	6,217	5,136	363,464
1984	4,021	4,601	16,732	30,806	44,454	58,744	55,728	57,412	42,668	18,121	7,059	4,834	345,180
1983	4,672	6,993	14,734	20,073	34,040	38,975	50,659	50,320	36,578	20,107	7,384	3,340	287,875
1982	5,531	6,897	19,703	29,711	43,011	55,267	53,035	52,025	36,934	18,992	10,845	7,464	339,415
1981	7,144	6,275	17,024	30,543	41,614	51,670	48,711	52,953	35,795	20,656	10,157	3,966	326,508
1980	3,599	4,687	15,915	27,050	39,099	47,171	43,685	47,837	31,387	16,983	7,481	5,625	290,519
1979	2,970	3,135	14,659	31,818	39,266	43,503	36,524	43,309	30,813	15,273	5,492	3,078	269,840

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Year	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Total
2017	6,925	3,361	7,147	11,292									28,725
2016	5,510	3,932	2,850	9,871	28,055	34,433	47,029	34,384	38,169	19,113	8,955	5,717	238,018
2015	4,600	4,136	5,968	8,896	23,176	33,141	45,328	27,197	29,878	16,626	5,550	4,670	209,166
2014	3,469	4,031	4,302	6,761	21,157	28,536	42,253	25,712	24,788	13,432	4,925	3,679	183,045
2013	4,046	3,410	6,698	8,606	23,708	21,927	37,010	33,279	23,945	5,789	3,296	4,138	175,852
2012	509	717	4,388	9,150	24,991	41,757	37,371	26,047	23,919	12,742	7,126	3,853	192,570
2011	3,289	3,207	4,012	4,885	12,722	24,589	28,381	39,032	26,905	12,297	5,031	3,986	168,336
2010	2,519	3,034	3,199	4,421	21,259	24,477	35,398	27,367	24,297	21,331	3,646	5,396	176,344
2009	2,896	2,936	4,137	6,378	17,349	28,824	33,975	28,343	26,428	11,553	6,075	2,557	171,451
2008	2,070	2,196	3,064	4,434	19,572	19,712	33,123	27,066	21,143	14,443	6,925	6,437	160,185
2007	7,105	5,254	14,622	14,944	22,728	30,105	33,598	29,479	24,181	23,626	11,811	2,123	219,576
2006	2,438	2,210	5,605	6,675	17,967	24,686	27,032	23,525	24,219	19,483	4,361	2,249	160,450
2005	2,454	3,263	2,814	6,683	17,785	33,902	43,429	30,978	21,662	12,606	3,490	1,748	180,814
2004	2,629	2,812	5,450	5,871	16,492	31,476	35,467	29,364	23,925	14,142	5,180	2,773	175,581
2003	3,237	2,133	3,695	5,817	22,931	26,230	35,243	27,237	20,690	12,256	4,183	3,595	167,247
2002	3,208	2,790	5,042	6,635	9,169	46,508	32,125	30,032	20,399	11,413	3,543	2,823	173,687
2001	2,468	2,153	3,944	6,319	17,649	29,964	42,156	30,943	26,981	12,585	4,845	1,011	181,018
2000	2,842	2,847	3,932	7,223	18,998	32,617	45,885	31,358	28,612	10,916	3,833	2,443	191,506
1999	5,787	2,444	4,875	5,290	16,589	32,819	43,484	35,456	28,557	16,821	5,369	2,651	200,142
1998	2,731	2,411	3,791	5,462	19,016	30,114	41,065	37,754	31,015	13,974	3,700	2,418	193,451
1997	2,512	2,043	4,990	5,476	18,455	32,105	52,330	45,887	27,433	12,589	3,691	2,352	209,863
1996	2,033	2,188	4,082	7,843	21,959	33,278	43,159	41,779	29,041	10,628	2,526	1,609	200,125
1995	2,537	1,999	5,042	6,858	19,919	34,624	48,386	42,794	31,517	15,930	4,393	7,114	221,113
1994	3,652	2,720	5,219	8,810	23,462	35,386	38,649	40,306	31,795	17,198	3,579	3,418	214,194
1993	3,566	3,458	7,189	8,176	26,124	49,405	73,032	70,591	46,749	21,059	5,116	4,857	319,322
1992	3,150	2,528	7,860	10,235	32,185	54,582	81,223	68,874	52,619	18,313	2,857	2,783	337,209
1991	1,489	4,163	8,100	6,585	30,146	50,663	70,418	65,442	49,838	21,242	4,047	4,203	316,336
1990	2,696	5,310	5,614	6,866	14,996	50,877	65,295	57,566	41,967	17,985	3,938	2,213	275,323
1989	2,090	3,045	8,651	7,185	23,921	47,280	68,558	67,297	35,430	16,264	5,550	3,315	288,586
1988	2,018	2,980	8,764	7,095	22,879	45,769	61,080	61,159	33,656	16,087	5,182	2,404	269,073
1987	2,959	2,573	8,752	7,035	22,763	48,986	65,920	70,313	33,799	15,420	4,403	2,516	285,439
1986	2,951	2,798	7,969	6,851	25,733	44,490	69,915	71,906	32,741	15,413	3,801	4,549	289,117
1985	2,948	2,569	3,843	7,136	22,253	42,334	64,474	64,108	32,252	16,609	3,788	3,698	266,012
1984	3,215	5,625	6,553	8,250	18,750	37,306	60,173	58,658	32,742	13,155	5,160	3,461	253,048
1983	3,675	8,250	11,550	7,781	21,893	40,249	71,247	67,744	35,603	14,854	3,972	4,800	291,618
1982	2,925	3,795	6,589	6,986	19,114	29,704	46,320	55,898	35,670	11,952	4,249	4,226	227,428
1981	4,744	2,967	3,413	10,391	26,787	37,812	56,509	55,879	42,500	16,073	5,141	4,388	266,604
1980	2,190	2,809	3,866	7,241	26,190	61,780	79,170	82,583	40,455	20,126	6,596	3,113	336,119
1979	1,920	2,846	4,980	6,476	23,145	41,962	44,158	51,759	35,063	14,520	4,723	2,734	234,286

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Year	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Total
2017	27,774	32,979	82,110	153,242	330,743								626,848
2016	24,285	34,330	92,080	137,698	292,369	380,354	384,390	365,738	366,702	180,925	67,714	38,525	2,365,110
2015	21,949	30,090	63,170	123,978	197,742	305,465	265,809	248,654	252,839	152,995	48,745	34,368	1,745,804
2014	18,006	21,066	53,422	101,133	157,099	211,989	219,744	230,442	217,004	131,490	44,669	29,677	1,435,741
2013	15,788	17,572	51,205	87,023	166,592	210,292	226,736	206,853	203,491	66,747	36,259	23,317	1,311,875
2012	16,265	18,680	42,546	89,738	163,348	198,749	220,851	211,071	242,075	123,308	36,251	22,470	1,385,352
2011	13,446	14,536	35,654	78,147	142,067	202,943	219,564	223,659	194,029	117,262	33,402	21,291	1,296,000
2010	12,402	14,957	38,460	72,125	154,228	190,632	235,722	211,111	213,022	96,075	30,633	16,125	1,285,492
2009	13,118	33,512	46,912	82,012	129,863	174,582	199,518	194,750	186,023	105,790	33,695	16,602	1,216,377
2008	11,024	14,488	42,956	75,143	107,709	172,120	183,100	173,837	156,547	64,776	26,575	15,046	1,043,321
2007	11,493	13,873	37,298	76,671	118,269	152,132	154,166	160,379	149,393	90,861	32,988	15,040	1,012,563
2006	13,772	15,329	31,152	74,520	104,013	125,785	138,960	135,491	119,800	82,216	32,257	17,381	890,676
2005	11,098	17,219	38,748	56,390	114,249	154,760	174,099	165,818	152,109	83,564	31,923	17,704	1,017,681
2004	12,911	12,708	37,785	75,449	110,922	141,240	156,430	157,487	160,851	81,867	23,834	15,769	987,253
2003	14,818	13,220	31,843	58,817	89,990	133,567	129,448	148,407	142,962	95,542	29,710	15,436	903,760
2002	19,146	22,014	41,829	66,326	97,798	129,210	135,104	124,549	130,362	77,732	25,971	16,395	886,436
2001	21,183	21,775	39,669	70,719	108,729	163,102	182,108	179,810	148,641	80,160	33,360	19,363	1,068,619
2000	13,491	16,242	33,521	82,038	108,148	152,280	194,101	192,429	165,866	83,947	33,591	23,621	1,099,275
1999	16,331	15,229	42,255	61,735	91,461	142,111	170,847	198,985	194,063	99,442	34,170	14,892	1,081,521
1998	13,656	12,608	34,282	61,662	116,179	163,381	192,913	188,294	202,986	114,653	48,525	17,192	1,166,331
1997	12,957	15,870	70,022	70,353	121,166	150,390	169,270	219,725	189,280	111,249	29,469	15,073	1,174,824
1996	24,302	25,544	68,649	86,414	120,132	173,431	161,919	231,120	184,492	116,245	27,213	50,139	1,269,600
1995	12,398	17,443	30,835	63,451	96,288	147,279	176,577	180,897	161,169	80,503	15,602	12,106	994,548
1994	15,278	9,535	28,973	49,044	87,482	152,793	261,192	177,876	145,569	65,940	18,881	15,571	1,028,134
1993	9,089	10,680	24,148	67,033	121,063	164,470	216,739	208,988	146,799	97,985	25,778	15,179	1,107,951
1992	10,614	11,679	22,727	64,288	108,951	156,278	184,940	187,498	131,676	102,552	24,050	12,921	1,018,174
1991	7,115	10,894	21,189	45,855	103,464	140,259	169,643	188,759	116,125	94,860	18,857	12,047	929,067
1990	7,070	7,580	19,071	54,744	93,384	129,038	157,620	176,378	107,697	81,048	19,059	9,970	862,659
1989	6,648	7,783	18,543	52,635	90,813	122,639	150,229	155,522	97,854	75,039	18,939	11,401	808,045
1988	4,817	7,277	17,112	42,493	86,275	124,453	160,175	149,395	99,595	73,800	17,300	8,656	791,348
1987	5,204	5,295	11,955	35,129	87,877	116,797	141,384	143,636	91,174	59,671	13,308	6,912	718,342
1986	4,009	4,523	13,303	25,824	64,445	95,120	121,833	119,427	68,839	42,120	10,795	7,780	578,018
1985	3,327	3,649	8,798	25,353	59,282	82,297	97,845	98,552	74,530	35,749	7,227	4,173	500,782
1984	3,465	5,209	9,455	23,319	60,919	82,263	91,539	96,068	74,660	37,167	7,278	3,762	495,104
1983	3,487	4,246	8,952	16,807	50,476	76,341	98,045	91,136	71,289	38,573	8,702	4,579	472,633
1982	3,176	4,210	9,286	23,380	60,942	76,843	97,296	91,436	58,755	34,485	8,269	3,439	471,517
1981	6,760	4,455	11,683	27,928	62,701	75,978	93,179	73,019	66,800	38,729	8,405	4,455	474,092
1980	3,598	4,278	8,788	21,942	58,572	111,333	129,063	105,209	72,256	38,174	10,662	7,666	571,541
1979	3,458	4,535	9,227	24,124	61,698	98,904	117,209	117,642	74,278	34,069	7,138	5,813	558,095

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Year	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Total
2017	7,434	18,698	65,115	82,159	107,756								281,162
2016	5,050	14,360	47,993	97,038	128,507	111,544	77,543	72,813	94,864	82,181	29,856	14,469	776,218
2015	6,376	10,550	47,529	73,625	91,284	75,578	69,008	76,100	82,163	69,966	22,100	10,328	634,607
2014	5,182	15,632	44,311	64,543	66,015	68,550	56,662	57,457	68,430	65,256	22,130	8,263	542,431
2013	3,617	6,495	35,930	54,979	75,369	53,996	69,681	41,655	64,496	34,508	16,368	5,148	462,242
2012	5,822	6,852	33,917	53,944	66,010	49,661	49,577	53,677	63,748	47,675	15,482	6,587	452,952
2011	3,778	6,449	27,781	52,941	77,155	51,268	49,955	63,815	63,613	57,486	13,544	5,988	473,773
2010	3,146	4,617	23,171	52,536	64,530	59,457	46,510	54,274	60,977	50,808	11,819	4,063	435,908
2009	3,792	5,886	31,146	44,339	66,797	63,943	44,514	50,513	59,475	47,701	14,397	3,738	436,241
2008	3,148	5,925	31,036	51,242	64,088	51,055	42,179	60,216	62,861	45,861	14,501	4,603	436,715
2007	3,378	5,987	26,304	49,333	59,677	44,744	38,247	46,957	70,170	48,970	19,113	4,680	417,560
2006	4,601	5,872	26,198	41,683	56,029	43,372	54,498	41,711	60,371	39,063	14,303	4,836	392,537
2005	3,957	5,670	30,907	39,709	56,291	46,908	51,275	40,225	55,225	45,512	13,569	4,133	393,381
2004	4,172	4,814	29,183	45,674	68,230	40,279	31,328	37,090	49,662	45,526	11,125	4,623	371,706
2003	4,923	4,914	39,160	43,718	56,781	40,942	36,121	39,533	52,597	45,456	17,401	5,440	386,986
2002	4,093	6,319	29,731	42,027	58,935	44,019	34,974	38,388	49,280	41,444	12,747	5,121	367,078
2001	4,110	4,900	31,114	42,864	55,109	41,146	40,845	42,685	46,720	37,326	17,402	4,371	368,592
2000	4,658	6,311	28,097	49,708	58,312	46,404	52,368	43,078	53,165	43,089	11,000	5,368	401,558
1999	5,205	6,411	32,755	45,645	66,447	52,227	55,171	57,020	59,149	45,558	15,332	5,240	446,160
1998	5,717	5,479	26,577	56,398	63,727	53,140	48,914	53,214	60,990	44,762	12,691	4,915	436,524
1997	3,983	7,311	28,875	47,302	62,222	51,274	52,474	59,108	58,424	45,259	12,146	4,319	432,697
1996	3,964	8,250	27,932	58,874	62,646	47,604	59,122	55,390	61,737	41,912	14,045	6,051	447,527
1995	4,176	7,327	31,555	49,320	69,210	57,919	51,677	57,702	59,197	46,089	11,805	2,792	448,769
1994	5,902	6,651	36,576	53,551	63,478	46,117	43,987	50,480	58,446	48,330	11,804	4,599	429,921
1993	4,582	4,890	29,711	51,172	77,141	51,787	42,379	52,522	57,673	44,142	13,315	5,530	434,844
1992	3,824	4,447	25,618	46,766	52,900	53,412	37,732	52,200	50,263	48,048	15,191	5,297	395,698
1991	3,811	3,926	20,734	40,440	52,868	43,875	33,229	34,052	45,082	45,485	10,446	5,367	339,315
1990	3,257	3,092	16,189	41,220	46,770	30,658	25,675	27,624	36,373	29,208	13,134	3,631	276,831
1989	1,210	1,443	23,046	32,357	41,633	25,516	25,712	26,889	33,702	30,992	10,670	4,241	257,411
1988	686	1,785	11,429	25,386	38,049	23,001	20,863	27,457	31,414	23,165	6,006	2,859	212,100
1987	1,671	1,744	8,496	22,463	31,506	18,661	20,556	22,827	21,827	16,530	4,930	1,173	172,384
1986	1,695	1,481	15,928	20,889	29,791	23,599	18,190	18,357	19,818	12,314	7,944	2,981	172,987
1985	1,162	1,454	7,028	18,629	23,130	12,346	9,035	10,857	14,728	11,673	4,774	1,856	116,672
1984	858	1,189	5,616	10,559	19,107	15,132	12,056	13,669	12,830	8,196	2,164	1,157	102,533
1983	1,372	1,385	4,772	10,642	19,673	16,829	13,362	10,906	10,404	7,283	2,547	847	100,022
1982	848	1,252	4,859	13,769	20,699	13,424	9,879	10,046	11,199	7,313	2,811	980	97,079
1981	2,189	2,146	4,714	13,514	15,415	9,274	10,433	9,993	10,160	6,577	3,766	1,734	89,915
1980	399	659	3,023	5,897	8,421	7,721	6,859	8,222	7,661	4,807	2,005	831	56,505
1979	1,225	726	7,087	10,097	15,216	10,075	6,796	7,919	8,141	5,144	1,495	624	74,545

Park Capitol Reef NP

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Recreation Visitors by Month

Capitol Reef NP

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Year	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Total
2017	10,546	15,835	58,636	146,830	175,686								407,533
2016	10,714	15,529	63,776	90,702	174,851	132,427	125,552	105,670	150,775	137,855	38,628	18,425	1,064,904
2015	9,083	15,187	49,126	84,453	131,165	118,355	129,060	121,043	135,543	103,721	33,425	10,868	941,029
2014	10,548	10,315	40,384	70,564	120,903	96,034	90,103	94,104	120,901	95,466	24,849	12,343	786,514
2013	5,915	7,608	39,512	53,120	114,082	90,063	87,889	77,279	102,187	57,139	20,600	8,276	663,670
2012	10,752	8,080	26,473	61,049	103,679	88,105	82,872	84,895	98,812	81,213	20,047	7,368	673,345
2011	6,614	7,596	26,318	61,751	88,387	104,752	99,998	79,717	97,230	69,650	17,561	9,260	668,834
2010	5,999	6,436	21,848	56,137	100,098	92,844	89,045	81,665	111,460	73,327	16,115	7,687	662,661
2009	6,200	7,561	23,052	54,627	92,630	81,430	84,737	72,759	95,922	73,782	17,171	7,337	617,208
2008	7,397	10,149	32,754	52,504	85,845	78,268	79,735	86,279	92,384	55,865	18,060	5,571	604,811
2007	5,904	7,167	24,592	58,371	81,026	74,525	63,676	69,827	88,350	57,927	17,200	6,342	554,907
2006	5,075	6,834	18,086	55,649	76,723	66,146	65,369	62,766	81,145	52,611	15,611	5,496	511,511
2005	4,604	6,462	28,917	47,550	83,056	77,067	74,409	64,961	79,673	56,577	16,515	10,464	550,255
2004	6,727	6,428	27,809	56,191	77,391	72,153	69,685	71,658	84,771	58,850	12,543	5,502	549,708
2003	8,932	8,448	22,280	50,657	74,452	70,856	65,030	65,174	80,415	62,967	18,705	7,525	535,441
2002	7,968	8,217	30,337	51,268	72,191	72,778	59,930	61,201	78,550	58,973	19,185	5,048	525,646
2001	7,342	8,982	27,354	60,251	72,417	70,812	66,766	67,835	72,060	50,164	17,441	6,336	527,760
2000	8,949	9,689	26,889	60,825	93,352	83,076	86,753	75,075	87,482	55,050	17,601	7,915	612,656
1999	10,552	9,645	35,406	54,092	130,948	79,044	71,084	94,006	98,160	67,488	21,657	8,071	680,153
1998	11,124	12,075	34,325	65,288	105,122	85,964	77,882	75,997	90,136	63,681	25,463	8,969	656,026
1997	7,723	10,713	45,192	44,569	95,953	84,016	91,367	77,067	81,820	52,634	20,663	13,963	625,680
1996	7,305	11,295	29,238	63,221	84,665	85,070	92,551	91,483	114,578	70,778	18,281	9,547	678,012
1995	8,294	10,981	25,562	53,834	83,877	92,784	87,579	91,475	100,508	66,806	17,876	9,288	648,864
1994	16,615	21,013	37,144	41,541	87,306	76,720	74,137	81,234	89,958	56,265	11,971	11,420	605,324
1993	4,872	5,744	20,203	53,187	80,006	80,186	88,387	92,526	102,782	61,880	14,396	6,538	610,707
1992	8,277	10,539	26,201	66,628	84,393	86,740	92,154	99,772	95,637	73,195	16,246	16,055	675,837
1991	5,685	10,255	28,511	44,605	86,038	81,796	94,390	83,101	94,876	63,409	15,502	9,888	618,056
1990	5,527	5,281	28,549	67,439	81,670	74,465	65,649	78,935	73,289	54,299	18,645	8,729	562,477
1989	3,905	6,313	33,690	47,507	69,315	67,716	67,597	75,299	72,531	45,763	17,246	8,396	515,278
1988	3,363	8,721	24,483	36,511	68,157	61,613	70,362	61,266	71,125	45,638	14,319	3,998	469,556
1987	4,590	7,157	13,319	43,348	69,238	50,320	64,005	65,168	52,959	42,531	10,794	5,379	428,808
1986	5,227	8,993	28,306	26,234	47,602	46,390	60,575	65,104	46,209	34,243	9,421	5,438	383,742
1985	3,990	3,999	11,190	30,541	50,178	50,074	49,074	51,836	35,985	24,476	6,050	3,110	320,503
1984	3,978	4,491	11,893	27,205	41,054	52,351	45,532	44,873	27,862	23,946	8,462	4,583	296,230
1983	3,119	4,816	10,631	24,108	50,608	51,792	55,160	44,430	45,544	29,719	7,757	4,050	331,734
1982	1,920	4,459	8,146	28,593	40,155	50,694	46,786	42,672	30,578	25,046	6,970	3,467	289,486
1981	5,573	4,873	9,245	41,465	60,189	64,536	74,350	55,757	46,058	25,615	6,984	3,144	397,789
1980	1,501	3,682	9,870	33,379	55,838	61,645	61,719	55,034	31,818	18,369	6,421	3,512	342,788
1979	1,620	2,471	9,661	39,171	46,359	45,839	39,455	39,963	33,191	22,473	5,933	2,724	288,860

Recreation Visitors By Month (1979 - Last Calendar Year)

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Grand Canyon NP

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Year	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Total
2017	217,102	239,154	502,739	590,006									1,549,001
2016	189,103	214,361	504,295	464,922	588,591	700,421	839,086	743,158	578,006	517,791	333,204	296,873	5,969,811
2015	191,781	224,311	437,563	486,989	541,338	614,938	714,911	793,412	525,090	444,363	273,558	272,482	5,520,736
2014	173,458	176,364	353,920	320,348	463,713	563,375	621,953	671,027	488,359	410,933	256,705	256,616	4,756,771
2013	143,405	145,356	359,799	375,899	468,178	613,479	728,543	633,026	465,665	197,742	217,733	216,015	4,564,840
2012	141,357	141,305	291,120	389,777	416,363	549,688	647,953	610,680	448,925	376,225	221,927	186,032	4,421,352
2011	139,029	120,726	304,583	388,363	419,569	544,089	654,871	595,265	410,636	348,203	201,809	171,035	4,298,178
2010	120,409	124,573	312,903	375,136	399,037	555,941	647,636	629,167	477,863	359,758	219,474	166,489	4,388,386
2009	135,463	132,865	310,717	393,469	432,940	529,833	658,993	600,442	425,737	352,207	214,355	161,047	4,348,068
2008	123,600	146,730	358,409	377,542	453,651	530,291	644,915	633,985	433,030	359,396	209,843	153,922	4,425,314
2007	139,636	155,049	332,226	431,874	443,773	515,106	604,185	580,670	424,493	362,602	235,217	188,837	4,413,668
2006	163,222	178,982	296,498	419,253	451,576	509,456	578,208	507,951	399,117	352,556	239,306	183,314	4,279,439
2005	132,660	151,719	356,357	380,473	444,253	594,410	611,813	572,431	392,835	335,518	230,597	198,456	4,401,522
2004	150,345	148,379	313,056	409,645	444,078	529,486	625,584	549,643	425,037	333,874	219,953	177,154	4,326,234
2003	156,481	148,388	274,120	340,245	398,371	536,251	603,109	550,855	377,719	335,317	220,124	183,920	4,124,900
2002	141,451	147,784	295,462	331,852	408,987	502,154	568,408	520,331	368,543	324,351	217,586	175,065	4,001,974
2001	152,246	133,442	304,407	363,932	446,090	517,870	620,638	565,883	348,445	287,259	192,539	172,058	4,104,809
2000	153,667	159,129	310,278	392,888	459,685	528,779	624,033	590,701	474,295	368,560	205,567	192,646	4,460,228
1999	154,225	168,127	367,827	345,769	456,674	564,036	655,350	608,486	491,822	378,777	206,084	177,947	4,575,124
1998	133,187	135,141	248,949	401,811	444,044	532,945	586,676	600,640	421,853	375,993	209,611	148,832	4,239,682
1997	133,291	174,087	347,740	324,011	465,990	540,275	730,341	591,024	599,107	444,433	251,808	189,561	4,791,668
1996	147,909	171,968	302,054	364,219	477,093	577,194	691,310	580,705	499,011	387,665	188,612	149,963	4,537,703
1995	124,843	158,170	286,118	371,843	464,743	665,255	678,871	678,492	439,849	381,572	166,568	141,321	4,557,645
1994	137,426	136,008	321,076	317,331	430,834	539,256	684,303	656,675	447,284	348,792	192,207	153,124	4,364,316
1993	113,555	124,186	267,508	326,969	462,722	610,570	755,833	744,485	481,004	356,060	186,556	146,154	4,575,602
1992	106,718	129,889	215,840	344,954	434,452	553,547	658,700	648,030	468,743	325,158	184,552	132,962	4,203,545
1991	119,713	137,010	173,728	262,163	420,242	530,436	583,108	561,165	451,446	361,865	181,771	103,384	3,886,031
1990	118,005	131,958	256,088	314,388	410,498	472,277	534,498	528,984	403,743	283,512	197,985	124,749	3,776,685
1989	107,390	128,648	261,150	280,218	409,344	543,782	542,509	536,221	440,897	345,439	225,092	145,519	3,966,209
1988	96,995	133,142	273,551	240,519	387,946	523,647	557,670	550,873	462,806	328,960	196,874	106,903	3,859,886
1987	94,561	110,009	188,661	294,786	352,013	457,635	485,310	525,178	425,004	299,263	168,321	112,289	3,513,030
1986	75,573	94,361	201,642	215,037	318,732	407,145	456,542	437,652	312,678	247,244	151,811	117,370	3,035,787
1985	54,330	66,986	143,335	217,613	295,024	391,629	411,347	366,036	304,431	240,488	114,023	106,287	2,711,529
1984	60,598	72,688	123,699	169,412	249,813	332,759	369,741	260,758	220,356	148,330	104,114	61,316	2,173,584
1983	49,146	65,862	118,768	141,134	233,043	364,817	400,961	305,589	226,922	181,782	94,483	65,575	2,248,082
1982	44,969	58,210	106,235	167,891	212,009	372,127	369,983	364,548	254,192	188,615	90,586	63,762	2,293,127
1981	87,337	88,570	119,264	205,490	244,709	364,113	398,756	378,831	247,606	185,318	83,734	68,542	2,472,270
1980	55,634	40,800	111,283	135,657	300,940	231,093	382,961	379,099	264,391	194,043	119,440	89,632	2,304,973
1979	37,002	46,043	91,927	123,643	205,048	297,877	338,935	350,694	294,206	187,335	98,410	60,596	2,131,716

Park Mesa Verde NP

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Recreation Visitors by Month

Mesa Verde NP

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Year	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Total
2017	5,601	5,737	21,016	34,568	64,239								131,161
2016	6,222	7,899	20,491	28,457	58,043	104,543	119,412	93,570	72,553	50,419	14,510	7,408	583,527
2015	5,813	5,759	14,616	31,721	55,079	97,331	114,814	90,545	67,970	43,659	11,230	8,788	547,325
2014	6,199	6,531	17,391	29,800	53,608	91,640	103,586	89,201	50,725	36,961	10,522	5,399	501,563
2013	5,758	5,573	13,963	23,005	52,250	87,746	99,900	82,980	60,415	9,002	11,471	8,174	460,237
2012	6,288	5,771	14,411	25,245	51,503	85,908	98,574	81,558	60,439	40,982	10,620	7,561	488,860
2011	5,788	5,323	14,311	24,325	59,077	113,928	120,840	103,413	70,453	37,264	9,906	7,701	572,329
2010	4,212	4,549	12,112	26,390	54,833	111,802	116,017	101,458	69,169	40,243	10,758	8,169	559,712
2009	4,978	5,435	14,645	23,865	52,419	108,944	118,091	98,797	67,224	37,587	11,591	6,801	550,377
2008	4,096	6,240	18,573	24,653	56,220	107,110	113,173	98,280	69,946	38,298	9,712	5,145	551,446
2007	4,101	6,533	18,123	24,362	54,087	101,158	108,353	103,321	67,942	31,684	12,157	9,281	541,102
2006	5,200	6,847	13,867	25,631	55,129	105,832	118,270	100,106	72,272	32,829	11,991	9,274	557,248
2005	5,188	5,035	16,579	22,892	52,117	95,570	105,330	88,348	57,200	31,087	11,057	7,930	498,333
2004	3,718	3,859	14,438	21,649	42,616	80,600	96,448	81,771	52,791	33,497	8,771	6,653	446,811
2003	5,240	4,533	11,270	22,083	41,268	83,797	86,887	82,861	47,380	36,768	10,814	5,689	438,590
2002	5,411	6,075	13,074	21,309	54,699	80,180	75,745	51,962	48,431	34,395	9,067	6,037	406,385
2001	5,953	5,890	14,448	25,140	50,627	91,085	112,374	97,236	56,142	37,384	11,533	5,597	513,409
2000	5,476	5,424	13,508	24,834	54,544	94,990	75,939	62,877	61,826	36,896	9,227	6,746	452,287
1999	5,659	6,060	18,890	23,073	60,979	112,029	140,050	127,159	79,689	43,272	11,626	7,250	635,736
1998	4,647	4,246	13,083	24,699	59,334	106,280	134,922	120,282	77,771	44,159	8,074	7,059	604,556
1997	4,176	4,411	16,079	24,749	58,024	113,185	145,272	131,793	74,904	40,824	8,937	5,366	627,720
1996	4,222	5,373	16,284	28,480	64,551	111,471	149,493	104,854	72,755	43,592	10,444	5,841	617,360
1995	4,683	6,375	16,118	26,730	61,234	106,569	168,285	135,332	80,150	45,786	9,817	2,715	663,794
1994	6,036	3,857	18,712	25,506	64,496	116,635	156,848	144,239	82,263	50,581	9,468	6,390	685,031
1993	3,768	4,666	13,283	28,573	64,748	113,462	150,932	142,614	79,541	48,728	10,015	5,724	666,054
1992	5,090	6,545	14,674	31,207	67,353	136,273	172,012	158,503	86,893	48,508	10,097	4,925	742,080
1991	3,885	6,001	12,317	22,225	61,574	96,769	173,774	158,191	80,823	45,855	11,434	5,227	678,075
1990	3,926	4,232	12,856	25,531	56,647	111,215	142,952	136,687	69,788	33,157	9,583	4,801	611,375
1989	2,990	3,401	14,593	21,683	57,557	111,661	128,270	134,791	70,471	37,899	10,457	6,272	600,045
1988	3,753	5,577	14,533	26,583	79,298	128,602	172,929	164,245	108,421	52,549	10,617	5,076	772,183
1987	4,386	4,441	9,726	23,938	75,867	125,223	165,166	156,573	101,517	45,013	12,266	4,450	728,566
1986	7,497	4,799	16,430	20,449	66,006	111,035	154,908	147,714	81,426	33,974	7,980	6,670	658,888
1985	5,346	4,628	10,218	20,971	65,931	117,501	155,297	139,039	82,706	36,328	11,246	7,060	656,271
1984	2,528	3,078	8,663	14,269	47,117	92,120	117,588	120,858	72,038	26,087	7,636	4,883	516,865
1983	3,584	3,200	7,680	14,620	65,574	108,195	141,833	130,249	79,709	38,707	8,364	2,400	604,115
1982	1,200	1,872	5,552	13,090	57,751	117,150	146,716	141,005	73,581	32,393	9,010	3,648	602,968
1981	3,402	1,808	3,200	12,104	65,226	108,301	141,882	130,318	77,007	35,166	7,378	2,816	588,608
1980	1,488	1,152	3,411	10,747	49,573	98,423	131,207	133,071	68,377	30,755	7,245	3,808	539,257
1979	1,664	1,840	6,368	12,209	1,711	87,622	123,625	123,412	70,815	34,938	6,375	3,136	473,715

Park **Zion NP**

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Zion NP

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Year	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Total
2017	88,561	110,569	345,476	515,652	509,017								1,569,275
2016	84,145	117,510	359,920	395,768	447,976	544,890	599,961	477,507	497,825	412,916	232,271	124,438	4,295,127
2015	78,318	106,314	291,118	392,417	400,048	458,546	479,538	455,487	394,201	314,966	180,390	97,503	3,648,846
2014	70,862	74,625	226,424	312,381	391,969	397,753	407,153	391,973	340,855	304,108	169,607	101,986	3,189,696
2013	56,972	64,994	227,899	292,765	313,594	367,217	379,129	345,014	339,593	203,056	141,251	75,903	2,807,387
2012	68,202	74,382	165,242	352,192	343,488	370,280	392,359	364,857	355,140	276,134	140,350	70,981	2,973,607
2011	64,524	67,801	164,037	255,813	325,089	376,453	391,144	360,196	324,727	273,876	145,158	76,687	2,825,505
2010	54,928	62,099	171,079	277,599	304,278	331,185	362,881	332,796	319,838	236,316	143,272	69,701	2,665,972
2009	60,204	62,964	167,246	271,709	296,330	366,004	368,933	372,157	306,161	265,095	132,998	65,601	2,735,402
2008	56,137	62,044	187,814	242,778	302,002	354,527	360,046	368,739	312,606	254,187	126,588	62,686	2,690,154
2007	68,640	71,530	176,622	286,701	281,149	333,005	338,116	337,824	314,290	253,572	129,962	65,870	2,657,281
2006	71,680	70,170	144,186	264,821	277,849	325,124	347,105	337,212	298,587	235,952	128,339	66,325	2,567,350
2005	63,566	70,260	195,530	230,366	283,547	339,849	347,745	340,826	298,465	227,570	118,083	70,858	2,586,665
2004	67,913	81,970	190,919	297,906	295,304	326,499	337,145	338,899	323,156	227,332	113,626	76,673	2,677,342
2003	71,233	72,781	143,284	244,910	304,556	308,634	294,996	312,162	280,970	229,992	119,860	75,414	2,458,792
2002	55,866	66,575	158,518	279,225	301,163	329,355	347,541	322,920	312,931	229,989	112,489	75,973	2,592,545
2001	61,795	53,960	95,231	207,864	210,707	323,759	321,920	344,531	261,476	179,932	105,821	50,783	2,217,779
2000	80,141	73,390	126,843	220,905	239,579	341,054	341,050	331,474	289,827	232,685	105,733	49,667	2,432,348
1999	73,220	69,337	122,668	218,059	218,639	298,448	335,012	373,744	309,215	237,279	124,086	69,957	2,449,664
1998	70,167	62,429	112,119	201,553	230,959	325,129	318,876	359,490	284,343	229,844	112,117	63,022	2,370,048
1997	65,244	68,431	128,143	230,390	226,370	326,154	333,883	367,010	304,847	230,274	104,605	60,183	2,445,534
1996	58,277	70,136	126,044	237,607	238,705	339,727	340,812	372,426	310,840	239,701	102,777	60,949	2,498,001
1995	60,215	70,317	119,841	189,511	202,000	337,268	363,645	377,107	312,443	224,457	119,920	53,438	2,430,162
1994	60,598	55,083	103,289	205,846	198,731	304,478	326,536	361,394	295,720	221,345	90,568	47,283	2,270,871
1993	52,236	50,599	106,142	206,549	220,669	335,945	348,106	376,382	290,893	258,341	92,657	54,061	2,392,580
1992	55,002	58,579	81,606	138,140	257,471	338,363	353,454	415,549	318,549	225,259	89,896	58,758	2,390,626
1991	54,687	64,780	71,951	131,160	255,396	336,422	349,020	362,064	278,614	208,030	80,061	44,812	2,236,997
1990	54,093	48,346	77,423	154,762	237,277	316,983	308,335	340,603	257,272	166,148	98,844	42,314	2,102,400
1989	33,534	38,254	94,224	132,387	235,179	300,330	304,532	321,244	248,105	163,695	86,055	41,317	1,998,856
1988	38,333	46,684	65,640	129,748	208,323	308,566	305,583	314,482	262,166	157,715	71,847	39,245	1,948,332
1987	35,783	37,091	57,095	117,924	203,914	267,237	296,526	300,993	231,095	131,044	61,714	37,203	1,777,619
1986	35,763	35,919	80,728	92,993	246,440	252,715	261,818	269,267	194,138	110,052	50,783	39,887	1,670,503
1985	23,339	30,716	54,763	95,748	201,599	229,265	253,508	253,802	182,744	100,050	44,125	33,613	1,503,272
1984	21,848	26,463	48,492	89,509	160,492	231,037	232,872	226,230	174,514	102,092	42,409	21,296	1,377,254
1983	18,578	24,133	36,086	75,772	183,803	201,746	227,243	202,119	154,567	90,204	37,866	20,913	1,273,030
1982	15,445	20,958	38,731	72,295	146,438	221,168	252,010	196,725	140,672	85,304	32,936	23,608	1,246,290
1981	24,349	22,594	35,058	63,036	132,198	221,905	233,041	262,514	150,219	86,905	34,820	22,169	1,288,808
1980	15,637	17,832	32,537	58,225	134,747	175,129	212,492	212,223	136,648	75,312	32,542	20,522	1,123,846
1979	8,994	12,106	23,079	63,306	122,964	156,734	168,614	187,461	173,883	77,131	29,139	17,117	1,040,528

Attachment 2

Summary of Visits to Eight Class I Areas in 2016

Summary of Visits to Eight Class I Areas in 2016

Class I Area	Total Recreation Visitors in 2016	Total Recreation Visitors in November through February 2016	Percentage of the Recreation Visitors in Off-Peak Season (November through February)
Arches	1,585,718	156,205	9%
Black Canyon	238,018	24,114	10%
Bryce Canyon	2,365,110	164,854	7%
Canyonlands	776,218	63,735	8%
Capitol Reef	1,064,904	83,296	8%
Grand Canyon	5,969,811	1,033,541	17%
Mesa Verde	583,527	36,039	6%
Zion	4,295,127	558,364	13%

To: Pruitt, Scott[Pruitt.Scott@epa.gov]
From: Brandon Kirkham
Sent: Thur 5/25/2017 2:06:31 PM
Subject: Meeting request

I am writing to request a meeting with Lee Tillman, CEO of Marathon Oil Corporation. Lee would appreciate the opportunity to discuss your regulatory reform efforts. Lee will be in Washington on June 6th and currently has broad availability that afternoon.

Thank you,

Brandon Kirkham

Four Rivers Consulting

brandon@frc-dc.com

202-329-4160

To: Pruitt, Scott[Pruitt.Scott@epa.gov]
Cc: Maia Raposo[mraposo@waterkeeper.org]; Daniel Estrin[destrin@waterkeeper.org]
From: Marc Yaggi
Sent: Tue 4/25/2017 5:32:11 PM
Subject: EPA meeting request
Letter to Administrator Pruitt April 17.pdf

Dear Administrator Pruitt,

Please see the attached letter respectfully requesting an opportunity to meet with you as soon as possible concerning EPA's ongoing effort to identify regulations that may be "repealed, replaced or modified to make them less burdensome," pursuant to Executive Order 13777 (February 24, 2017) ("EO") and your memorandum dated March 24, 2017 ("Memorandum").

Thank you for your consideration.

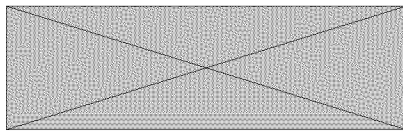
Marc

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Marc A. Yaggi
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To: Pruitt, Scott[Pruitt.Scott@epa.gov]
From: BARBARA WEISS
Sent: Thur 4/27/2017 3:50:19 PM
Subject: regulatory reform

I strongly oppose your efforts to roll back environmental protections. I support The Endangered Species Act, Clean Water Act, Clean Air act both in letter and in spirit. When you remove regulations to allow deterioration of irreplaceable resources in favor of questionable economic gains, you are stealing from the American people and our descendants. Your job is to protect our natural heritage. Do your job, not the job of the oil companies that have supported your career.

We are watching.